

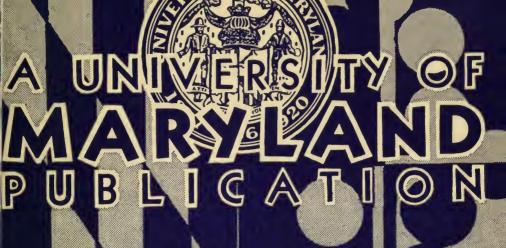


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Volume 2 MARCH 10, 1950 Number 13

# GRADUATE SCHOOL ANNOUNCEMENTS

ISSUE 1950-1951

Botany

UNIVERSITY OF MARYLAND
College Park, Maryland

# GRADUATE SCHOOL SUPPLEMENT TO GENERAL CALENDAR ON PAGE 6 — 1950-51

1950		102 0 1000 01
October 4	Wednesday	Modern language examination for Ph.D requirement
October 7	Saturday	Last day to file applications for admission to candidacy for Doctor's degree at 1951 Commencement
1391		
February 7	Wednesday	Modern language examinations for Ph.D. requirement
February 10	Saturday	Last day to file applications for admission to candidacy for Master's degree at 1951 Commencement
May 19	Saturday	Last day to deposit Doctor's theses in the Office of the Graduate School
May 26	Saturday	Last day to deposit Master's theses in the Office of the Graduate School
June 6	Wednesday	Modern language examination for Ph.D. requirement
June 9	Saturday	Last day to file applications for admission to candidacy at June meeting of the Graduate Council

# IMPORTANT

THE provisions of this publication are not to be regarded as an irrevocable contract between the student and the University of Maryland. The University reserves the right to change any provision or requirement at any time within the student's term of residence. The University further reserves the right at any time, to ask a student to withdraw when it considers such action to be in the best interests of the University.

See outside back cover for list of other catalogs

Index on Inside Back Cover

Volume 2 MARCH 10, 1950 Number 13

## A UNIVERSITY OF MARYLAND PUBLICATION

is published three times during April, twice during May, once in August, October, and December, and three times in January, February and March.

Entered at the Post Office in College Park, Maryland, as second class mail matter under the Act of Congress of August 24, 1912.

Edited by Harvey L. Miller, Director of Publications, University of Maryland.

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AND

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Members of the Roard are appointed by the Governor of the Stat	e for

Members of the Board are appointed by the Governor of the State for terms of nine years each, beginning the first Monday in June.

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The State Law provides that the Board of Regents of the University of Maryland shall constitute the Maryland State Board of Agriculture.

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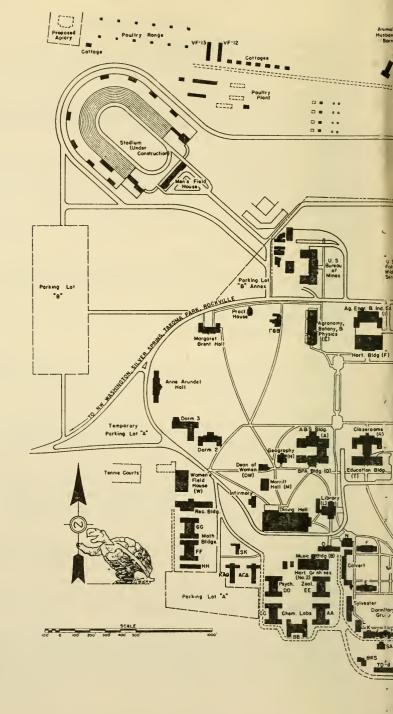
Assistant Dean Rosalie Leslie, *Chairman*; Professors Marie Bryan, Daiker, Gewehr, Hamilton, McNaughton, Randall, Reid, Scott, Shreeve, White.

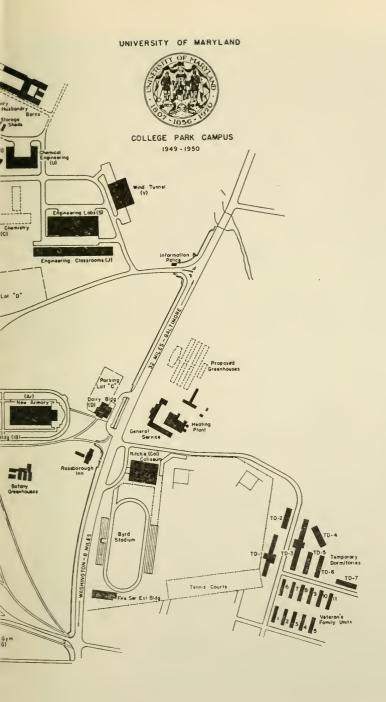
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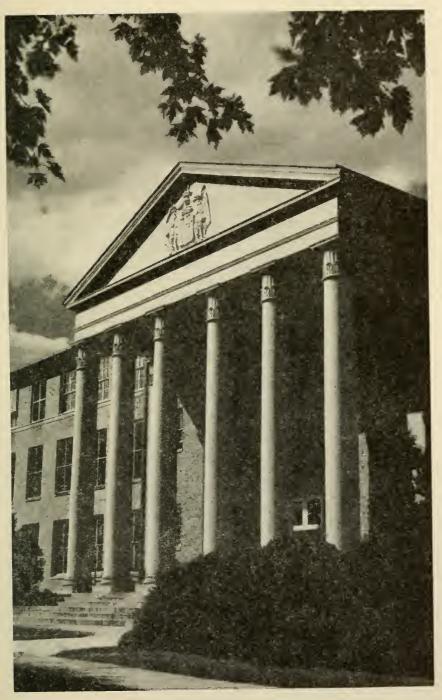
# CALENDAR—1950-1951 COLLEGE PARK First Semester

Registration, first semester

1950

September 18-22 Monday-Friday

	September 25	Monday	Instruction begins			
	October 19	Thursday	Convocation, faculty and students			
	November 22	Wednesday after last class	Thanksgiving recess begins			
	November 27	Monday, 8 a. m.	Thanksgiving recess ends			
	December 20	Wednesday after last class	Xmas recess begins			
	1951					
	January 3	Wednesday, 8 a. m.	Xmas recess ends			
	January 20	Saturday	Charter Day, Alumni Banquet			
	January 24-31	Wednesday-Wednesday, inc.	First semester examinations			
		Second Ser	nester			
	February 6-9	Tuesday-Friday	Registration, second semester			
	Fehruary 12	Monday	Instruction begins			
	February 22	Thursday	Washington's Birthday, holiday			
	March 22	Thursday after last class	Easter recess begins			
	March 25	Sunday	Maryland Day			
	March 27	Tuesday, 8 a. m.	Easter recess ends			
	May 17	Thursday	Military Day			
	May 30	Wednesday	Memorial Day, holiday			
	June 1-8	Friday-Friday, inc.	Second semester examinations			
	June 3	Sunday	Baccalaureate exercises			
	June 9	Saturday	Commencement exercises			
	Summer Session, 1951					
	June 23-25	Saturday a. mMonday	Registration, summer session			
	June 26	Tuesday	Session begins			
	August 3	Friday	Session ends			
Short Courses						
	June 18-23	Monday-Saturday	Rural Women's Short Course			
	July 10-13	Tuesday-Friday	Maryland Congress of Parents and Teachers			
	August 6-11	Monday-Saturday	4-H Club Week			
	September 4-7	Tuesday-Friday	Firemen's Short Course			



Entrance to Graduate School Building

# GRADUATE SCHOOL ANNOUNCEMENTS, 1950-1951

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EDUARD UHLENHUTH, Ph.D., Professor of Gross Anatomy (Baltimore)

# GRADUATE FACULTY

RONALD BAMFORD, Ph.D., Acting Dean

The faculty of the Graduate School includes all members of the various faculties who give instruction in approved graduate courses. The general administrative functions of the graduate faculty are delegated to the Graduate Council.

# GENERAL INFORMATION HISTORY AND ORGANIZATION

In the earlier years of the institution the Master's degree was frequently conferred, but the work of the graduate students was in charge of the departments concerned, under the supervision of the general faculty. The Graduate School of the University of Maryland was established in 1918, and organized graduate instruction leading to both the Master's and the Doctor's degree was undertaken. The faculty of the Graduate School includes all members of the various faculties who give instruction in approved graduate courses. The general administrative functions of the graduate faculty are delegated to a Graduate Council, of which the Dean of the Graduate School is chairman.

# LOCATION

The University of Maryland is located at College Park, in Prince George's County, Maryland, on the Baltimore and Ohio Railroad, eight miles from Washington and thirty-two miles from Baltimore. Washington, with its wealth of resources, is easily accessible by train, street car and bus.

The professional schools of Medicine, Nursing, Pharmacy, Dentistry and Law are located in Baltimore, at the corner of Lombard and Greene Streets.

#### LIBRARIES

In addition to the resources of the University libraries the great libraries of the national capital are easily available for reference work. Because of the proximity of these libraries to College Park they are a valuable asset to research and graduate work at the University of Maryland.

# GENERAL REGULATIONS

#### ADMISSION

An applicant for admission to the Graduate School must hold a bachelor's or a master's degree from a college or university of recognized standing. The applicant shall furnish an official transcript of his collegiate record which for unconditional admission must show creditable completion of an adequate amount of undergraduate preparation for graduate work in his chosen field. Application for admission to the Graduate School should be made prior to dates of registration on blanks obtained from the office of the Dean.

After approval of the application a matriculation card, signed by the Dean, is issued to the student. This card permits one to register in the Graduate School. After payment of the fee, the matriculation card is stamped and returned to the student. It is his certificate of membership in the Graduate School and should be retained by the student to present at each succeeding registration.

Admission to the Graduate School does not necessarily imply admission to candidacy for an advanced degree.

# REGISTRATION

All students pursuing graduate work in the University, even though they are not candidates for higher degrees, are required to register in the Graduate School at the beginning of each session. In no case will graduate credit be given unless the student matriculates and registers in the Graduate School. The program of work for each session is arranged by the student with the major department and entered upon two course cards, which are signed first by the professor in charge of the student's major subject and then by the Dean of the Graduate School. One card is retained by the Dean. The student takes the other card, and in case of a new student, also the matriculation card, to the Registrar's office, where the registration is completed. Students will not be admitted to graduate courses until the Registrar has certified to the instructor that registration has been completed. Course cards may be obtained at the Registrar's office or at the Dean's office. The heads of departments usually keep a supply of these cards in their respective offices.

# GRADUATE COURSES

Graduate students must elect for credit in partial fulfillment of the requirements for higher degrees only courses designated For Graduates or

For Graduates and Advanced Graduates. Students who are inadequately prepared for graduate work in their chosen fields or who lack prerequisites for minor courses may elect a limited number of courses numbered from 1 to 99 in the general catalogue, but graduate credit will not be allowed for these courses. Courses that are audited are registered for in the same way as other courses, and the fees are the same.

# PROGRAM OF WORK

The professor who is selected to direct a student's thesis work is the student's adviser in the formulation of a graduate program, including suitable minor work, which is arranged in cooperation with the instructors. To encourage thoroughness in scholarship through intensive application, graduate students in the regular sessions are limited to a program of fifteen credit hours per semester. If a student is preparing a these during the minimum residence for the master's degree, the registration in graduate courses should not exceed twelve hours for the semester.

# SUMMER SESSION

The University conducts a six weeks' summer session at College Park, with a comprehensive undergraduate and graduate program. The University publishes a separate bulletin giving full information on this summer session. This bulletin is available upon application to the Director of the Summer Session, University of Maryland, College Park.

# GRADUATE WORK IN PROFESSIONAL SCHOOLS AT BALTIMORE

Graduate courses and opportunities for research are offered in the professional schools at Baltimore. Students pursuing graduate work in the professional schools must register in the Graduate School, and meet the same requirements and proceed in the same way, as do graduate students in other departments of the University. The graduate courses in the professional schools are listed on pages

# GRADUATE WORK BY SENIORS IN THIS UNIVERSITY

A senior of this University who has nearly completed the requirements for the undergraduate degree may, with the approval of his undergraduate dean and the Dean of the Graduate School, register in the undergraduate college for graduate courses, which may later be transferred for graduate credit toward an advanced degree at this University, but the total of undergraduate and graduate courses must not exceed fifteen credits for the semester. Excess credits in the senior year cannot later be used for graduate credit unless such pre-arrangement is made. Seniors who wish to register for graduate credit should apply to the Dean of the Graduate School for information about procedure.

# ADMISSION TO CANDIDACY FOR ADVANCED DEGREES

Application for admission to candidacy for the Master's and for the Doctor's degree is made on application blanks which are obtained at the

office of the Dean of the Graduate School. These are filled out in duplicate by the student and submitted to his major department for further action and transmission to the Dean of the Graduate School. All applications for admission to candidacy must be approved by the Graduate Council.

Admission to candidacy in no case assures the student of a degree, but merely signifies he has met all the formal requirements and is considered by his instructors sufficiently prepared and able to pursue such graduate study and research as are demanded by the requirements of the degree sought. The candidate must show superior scholarship in graduate work already completed.

Application for admission to candidacy is made at the time stated in the sections dealing with the requirements for the degree sought.

# REQUIREMENTS FOR THE DEGREES OF MASTER OF ARTS AND MASTER OF SCIENCE

Advancement to Candidacy. Each prospective candidate for the Master's degree is required to make application for admission to candidacy not later than the date when instruction begins for the semester in which the degree is sought. He must have completed at least twelve semester hours of graduate work at the University of Maryland. An average grade of "B" in all major and minor subjects is required.

Minimum Residence. A residence of at least two semesters, or equivalent, at this institution, is required.

Course Requirements. A minimum of twenty-four semester hours, exclusive of thesis and registration for research, with an average grade of "B" in courses approved for graduate credit, is required for the degrees of Master of Arts and Master of Science. At the option of the major department concerned the student may be required also to register for a maximum of six semester hours for research and thesis work. The total number of credit hours required for the degree would then be thirty. If the student is inadequately prepared for the required graduate courses, either in the major or minor subjects, additional courses may be required to supplement the undergraduate work. Of the twenty-four hours required in graduate courses, not less than twelve hours and not more than sixteen semester hours must be earned in the major subject. The remaining credits must be outside the major subject and must comprise a group of coherent courses intended to supplement and support the major work. Not less than onehalf of the total required course credits for the degree, or a minimum of twelve, must be selected from courses numbered 200 or above. No credit for the degree of Master of Arts or Master of Science may be obtained for correspondence courses. The entire course of study must constitute a unified program approved by the student's major adviser and by the Dean of the Graduate School.

Transfer of Credit. Credit not to exceed six semester hours, obtained at other recognized institutions, may be transferred and applied to the

course requirements of the Master's degree, provided that the work was of graduate character, and provided that it is approved for inclusion in the student's graduate program at the University of Maryland. This transfer of credit is submitted to the Graduate Council for approval when the student applies for admission to candidacy for the degree. Acceptance of the transferred credits does not reduce the minimum residence requirement. The candidate is subject to final examination by this institution in all work offered for the degree.

Thesis. In addition to the twenty-four semester hours in graduate courses a satisfactory thesis is required of all candidates for the degrees of Master of Arts and Master of Science. (Exceptions may be made in the cases of candidates for the degree of Master of Arts in American Civilization. See page 13.) The thesis must demonstrate the student's ability to do independent work and it must be acceptable in literary style and composition. With the approval of the student's major professor and the Dean of the Graduate School, the thesis in certain cases may be prepared in absentia under direction and supervision of a member of the faculty of this institution.

The original copy of the thesis must be deposited in the office of the Graduate School not later than two weeks before the convocation at which the degree is sought. The thesis should not be bound by the student, as the University later binds all theses uniformly. An abstract of the contents of the thesis, 200 to 500 words in length, must accompany it. A manual giving full directions for the physical make-up of the thesis is in the hands of each professor who directs thesis work, and should be consulted by the student before the typing of the manuscript is begun. Individual copies of this manual may be obtained by the student at the Dean's office, at nominal cost.

Final Examination. The final oral examination is conducted by a committee appointed by the Dean of the Graduate School. The student's adviser acts as the chairman of the committee. The other members of the committee are persons under whom the student has taken most of his major and minor courses. The chairman and the candidate are notified of the personnel of the examining committee at least one week prior to the period set for oral examinations. The chairman of the committee selects the exact time and place for the examination and notifies the other members of the committee and the candidate. The examination should be conducted within the dates specified by the Dean of the Graduate School at the end of the semester, but upon recommendation of the student's adviser, an examining committee may be appointed by the Dean of the Graduate School at any time when all other requirements for the degree have been completed. A report of the committee is sent to the Dean as soon as possible after the examination. A special form for this purpose is supplied to the chairman of the committee. Such report is the basis upon which recommendation is made to the faculty that the candidate be granted the degree sought. The period for the oral examination is usually about one hour, but the time should be long enough to insure an adequate examination.

The examining committee also approves the thesis, and it is the candidate's obligation to see that each member of the committee has ample opportunity to examine a copy of the thesis prior to the date of the examination.

A student will not be admitted to final examination until all other requirements for the degree have been met. In addition to the oral examination a comprehensive written examination may be required at the option of the major department.

# REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN AMERICAN CIVILIZATION

Studies in American Civilization are intended to prepare the student for teaching, for further study, and for research in the general field of American Civilization, but with emphasis on one of two disciplines: history, including European backgrounds; or literature, including European literature, particularly English. All students will be expected to understand the development of American institutions and to demonstrate proficiency in the literary, social, economic, and political history of the United States.

With the approval of his adviser, a candidate for the Master of Arts degree with a major in American Civilization may elect in lieu of the thesis six additional hours of course work, to include at least two substantial seminar papers. The total number of credit hours required for the degree would then be thirty semester hours.

Each candidate must present credits for at least fifteen semester hours of work in American literature and American history, and credits for at least fifteen semester hours in supporting courses (nine hours if a thesis is elected). Supporting courses will normally be in such fields as European or Latin-American history, English literature, comparative literature, philosophy, art, education, sociology, economics, and politics and government.

Each candidate must demonstrate in a written examination that he possesses a reading knowledge of one foreign language.

All other requirements are the same as for the degrees of Master of Arts and Master of Science in other fields.

# REQUIREMENTS FOR THE DEGREE OF MASTER OF EDUCATION

Thirty semester hours of course work are required, which may include courses in departments other than Education not to exceed one-half of the total thirty hours, such courses to be selected in conformity with the student's special needs as agreed upon by the student and his adviser. Of the thirty hours, not less than one-half must be on the 200 level.

At least four of the thirty semester hours must be in seminar work in connection with which two seminar papers will be prepared in specially prescribed form, approved in writing by the instructor in charge of the seminar and the Dean of the College of Education, and filed in the College of Education. One of these papers shall deal with a topic in the student's major field of concentration.

Included in the program must be courses in educational statistics and in procedure of educational research.

The requirements in regard to advancement to candidacy, transfer of credits, and final oral examination are the same as for the degrees of Master of Arts and Master of Science.

# REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION

The degree of Master of Business Administration represents a minimum of two semesters of graduate work in addition to the satisfaction of all undergraduate requirements for the Bachelor's degree. Graduate work will included a minimum of twenty-four semester course hours approved by student's advisor, of which 12 hours must be courses of the 200 level, and the completion of a satisfactory thesis. With the approval of the student's major advisor and the Dean of the College of Business and Public Adminisstration, lower numbered courses may occasionally be offered as substitutes. An average grade of "B" must be obtained in the twenty-four hours offered for graduate credit.

The undergraduate prerequisites for graduate work leading to the degree of Master of Business Administration may be satisfied by completion of work for the degree of Bachelor of Science in Business Administration at the University of Maryland, or by equivalent work leading to a corresponding degree at another accredited institution, providing this work is acceptable.

If any core group courses required for the degree of B.A. in Business Administration at this institution have not been taken, such courses must be taken in addition to the requirements for the M.B.A. degree. The list of core group courses includes principles of economics and accounting, the equivalent of six semester hours in business law, and introductory courses in labor economics, labor management, money and banking, financial management, marketing principles, marketing administration, and business statistics (see Bulletin of College of Business and Public Administration for detailed list of core group courses.

Those who hold the Bachelor's degree in Business Administration may normally expect to complete the work for the M.B.A. in one year, while those who hold a B.A. or B.S. degree, other than in Business Administration, could usually complete the requirements within two years.

The requirements in regard to the final oral examination are the same as for the degrees of Master of Arts and Master of Science.

# GRADUATE YEAR ABROAD

Realizing the value for American students of study abroad, the University of Maryland has set up Foreign Study Centers to coordinate and direct work of graduate students in Paris, France, and Zurich, Switzerland. Furthermore, the University has established the degree of Master of Foreign Study which will serve to give an American evaluation of work done abroad by the graduate students. The student attends courses at the University of Paris or at the University of Zurich and returns to the University of Maryland to submit his thesis and take an examination.

Since the system in European universities is quite different from that in American institutions, the registrants for Foreign Study participate in an orientation period in Paris or Zurich which serves to improve their knowledge of the language and to familiarize them with European customs and institutions.

Two kinds of awards are offered: the *Certificate*, for the successful completion of an approved program of thirty semester hours; and the Master of Foreign Study degree. The requirements for this degree are the same as those for a Master of Arts—twenty-four semestr hours divided between a major and a minor and completion of a thesis.

The Foreign Study Office is directed locally by Dr. A. E. Zucker, chairman, Division of Humanities, while Dr. Edmund E. Miller is resident director abroad with his offices in Zurich. For the year 1948-49 Dr. William R. Quynn and Professor F. C. A. Koelln are acting as resident deans in Paris and Zurich, respectively, and Dr. Dorothy M. Quynn is serving as non-resident professor of history in Paris. All communications concerning this program should be directed to the Foreign Study Office, University of Maryland, College Park, Maryland.

# REQUIREMENTS FOR THE DEGREE OF DOCTOR OF EDUCATION

The Doctor of Education degree is offered for students who expect to hold teaching or administrative positions in education and who desire to develop exceptional competence in special areas. The ability to explore and solve practical educational problems is emphasized. The requirements are the same as for the degree of Doctor of Philosophy except as specified below.

Foreign Languages. The requirement of foreign languages may be waived for candidates for this degree when the program of study and research does not involve the use of foreign languages.

Major and Minor Subjects. The candidate must select one major area in which he expects to develop exceptional competence. The amount of required course work in the major subject will vary with the individual candidate.

In addition to the major, the candidate must select approximately five other areas in which he intends to develop a high degree of competence. One or two of these areas may be designated as minor fields.

The candidate must register for a minimum of six hours of research.

Project. Instead of completing a thesis as required for a candidate for the degree of Doctor of Philosophy a candidate for this degree must demonstrate exceptional competence to work through field problems by completing a project in the major area. A Committee on Doctoral Research is appointed for each candidate. The committee is composed of three members, at least two of whom are from the faculty of the College of Education. The committee passes upon the student's plans for research, determines the amount of course credit to be allowed for the doctoral study. The specialist in the student's major area serves as sponsor and provides detailed guidance for the project.

The regulations governing submission and form of copies of the project are the same as for the Ph. D. thesis.

Comprehensive Examination. A comprehensive examination must be passed before the candidate may take the final oral examination. The comprehensive examination may be oral or written, or both; it will cover the general field of major and minor study.

Final Oral Examination. The final examination covers the project and its relationship to the general field in which it lies and the candidate's attainments in related areas.

# REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

Advancement to Candidacy. Candidates for the Doctor's degree must be admitted to candidacy at least one academic year before the final examination. Applications for admission to candidacy for the Doctor's degree are made in duplicate by the student and submitted to his major department for further action and transmission to the Dean of the Graduate School. Blanks may be obtained at the office of the Graduate School.

The applicant must have demonstrated to the head of the Foreign Language Department that he possesses a reading knowledge of French and German. With the approval of the major department and the Graduate Council, in special cases another Foreign language may be substituted for either French or German. Preliminary examinations or such other substantial tests as the departments may elect are also required for admission to candidacy.

Residence. The equivalent of three years of full-time graduate study and research is the minimum required. Of the three years the equivalent of at least one year must be spent in residence at the University. On a part-time basis the time needed will be correspondingly increased. All work at other institutions offered in partial fulfillment of the requirements for the Ph.D. degree is submitted to the Graduate Council for approval, upon recommendation of the department concerned, when the student applies for admission to candidacy for the degree.

The Doctor's degree is not given merely as a certificate of residence and work, but is granted only upon sufficient evidence of high attainments in scholarship, and ability to carry on independent research in the special field in which the major work is done.

Major and Minor Subjects. The candidate must select a major and one or two closely related minor subjects. At least twenty-four semester hours, exclusive of research, are required in minor work. The remainder of the required residence is devoted to intensive study and research in the major field. The amount of required course work in the major subject will vary with the department and the individual candidate. The candidate must register for a minimum of twelve semester hours of research.

Thesis. The ability to do independent research must be shown by a dissertation on some topic connected with the major subject. An original type-written copy and two clear, plain carbon copies of the thesis, together with an abstract of the contents, 250 to 500 words in length, must be deposited in the office of the Dean at least three weeks before the convocation at which the degree is sought. It is the responsibility of the student also to provide copies of the thesis for the use of the members of the examining committee prior to the date of the final examination.

The original copy should not be bound by the student, as the University later binds uniformly all theses for the general University library. The carbon copies are bound by the student in cardboard covers which may be obtained at the Student's Supply Store. The abstracts are published biennially by the University in a special bulletin.

A manual giving full directions for the physical make-up of the thesis is in the hands of each professor who directs thesis work, and should be consulted by the student before typing of the thesis is begun. Students may obtain copies of this manual at the Student's Supply Store.

Final Examination. The final oral examination is held before a committee appointed by the Dean. One member of this committee is a representative of the graduate faculty who is not directly concerned with the student's graduate work. One or more members of the committee may be persons from other institutions who are distinguished scholars in the student's major field.

The duration of the examination is approximately three hours, and covers the research work of the candidate as embodied in his thesis, and his attainments in the fields of his major and minor subjects. The other detailed procedures are the same as those stated for the Master's examination.

# RULES GOVERNING LANGUAGE EXAMINATIONS FOR CANDIDATES FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

1. A candidate for the Doctor's degree must show in a written examination that he possesses a reading knowledge of French and German. With the approval of the major department and the Graduate Council, in special cases another foreign language may be substituted for either French or

German. The passages to be translated will be taken from books and articles in his specialized field. Some 300 pages of text from which the applicant wishes to have his examination chosen should be submitted to the head of the Department of Foreign Languages at least three days before the examination. The examination aims to test ability to use the foreign language for research purposes. It is presumed that the candidate will know sufficient grammar to distinguish inflectional forms and that he will be able to translate readily in two hours about 500 words of text, with the aid of a dictionary.

- 2. Application for admission to these tests must be filed in the office of the Department of Foreign Languages at least three days in advance of the tests.
- 3. No penalty is attached to failure in the examination, and an unsuccessful candidate is free to try again at the next date set for these tests.
- 4. Examinations are held near the office of the Department of Foreign Languages, on the first Wednesday of October, February and June, at 2 p.m.

# GRADUATE FEES

The fees paid by graduate students are as follows:

Matriculation fee of \$10.00. This is paid once only, upon admission to the Graduate School.

Diploma fee for Master's degree, \$10.00.

Graduation fee for Doctor's degree including a hood, \$30.00.

# College Park:

A fixed charge, each semester, of \$8.00 per semester credit hour for students carrying eight hours or less; for students carrying more than eight hours, \$65.00 for the semester.

Laboratory fees, where charged, range from \$1.00 to \$10.00 per course per semester.

# Living Expenses and Self Help:

Board and lodging are available in many private homes in College Park and vicinity. The cost of board and room changes from about \$50.00 to \$55.00 a month, depending on the desires of the individual. A list of accommodations is maintained in the offices of the Dean of Women and the Dean of Men.

Application for student employment, aside from fellowships and assistantships, may be made through the offices of the Dean of Men and the Dean of Women, or to department heads.

# FELLOWSHIPS AND ASSISTANTSHIPS

Fellowships. A number of fellowships have been established by the University. The stipend for the University fellows is \$600 for nine months and the remission of all graduate fees except the diploma fee. Several industrial and special fellowships, with varying stipends, are also available in certain departments.

Fellows are required to render minor services prescribed by their major departments. The usual amount of service required does not exceed twelve clock hours per week. Fellows are permitted to carry a full graduate program, and they may satisfy the residence requirement for higher degrees in the normal time.

Applications for fellowships are made on blanks which may be obtained from the office of the Graduate School. The application, with the necessary credentials, is sent by the applicant directly to the Dean of the Graduate School. Applications which are approved by the Dean are forwarded to the departments, where final selection of the fellows is made. The awards of University fellowships are on a competitive basis.

Graduate Assistantships. A number of teaching and research assistantships are available in several departments. The compensation is \$100 per month unless otherwise specified and varies with the nature and amount of service required and with the terms of appointment. The amount of credit allowed toward a degree likewise varies with the amount of time available for graduate study. The research assistants, especially those in the Experiment Station, usually participate in research that meets the requirements for a Master's or a Doctor's degree.

Applications for graduate assistantships are made directly to the departments concerned and appointments are made through the regular channels for staff appointments. Further information regarding these assistantships may be obtained from the department or college concerned.

#### COMMENCEMENT

Attendance is required at the commencement at which the degree is conferred.

Application for diploma must be filed in the office of the Registrar eight weeks before the convocation at which the candidate expects to obtain a degree.

Academic costume is required of all candidates at commencement. Those who so desire may purchase or rent caps and gowns at the Student's Supply Store. Order must be filed eight weeks before the date of convocation but may be cancelled later if the student finds himself unable to complete his work for the degree.

A time schedule, supplementing this catalog, is issued shortly before the beginning of each semester, showing the hours and location of class meetings. This schedule is available at the office of the Graduate School, or the office of the Registrar.

The provisions of this bulletin are not to be regarded as an irrevocable contract between the student and the University. The University reserves the right to change any provision or requirement at any time within the student's term of residence.

# DESCRIPTION OF COURSES

For the convenience of students in making out schedules of studies, the subjects in the following Description of Courses are arranged alphabetically:

Agricultural Economics	2
Agricultural Education and Rural Life	23
Agronomy	24
Anatomy	101
Animal Husbandry	25
Bacteriology	106
Biochemistry	103
Botany	107
Business and Public Administration	29
Chemistry	39
Comparative Literature	43
Crafts	76
Dairy Husbandry	44
Dentistry	
Economics	
Education	
Engineering	
English Language and Literature	
Entomology	
Foreign Languages and Literature	
Geography	33
Government and Politics	38
History	71
Home Economics	75
Horticulture	79
Mathematics	81
Medicine	
Pharmaceutical Chemistry	
Pharmacognosy	
Pharmacology	
Pharmacy	
Philosophy	
Physical Education, Health, Recreation	86
Physics	
Physiology101,	
Poultry Husbandry	90
Practical Art	76
Psychology	91
Sociology	94
Speech	96
Veterinary Science	98
Zoology	98

# METHOD OF NUMBERING COURSES AND COUNTING CREDIT HOURS

Courses for Advanced Undergraduates and Graduates are numbered 100 to 199; courses for Graduates only are numbered 200 and upward.

A course with a single number extends through one semester.

A course with a double number extends through two semesters.

The number of semester hour credits is shown by the arabic numerals in parentheses after the title of the course. Examples:

Course 101. Title (3). First semester.

If a laboratory course:

Course 101. Title (3). One lecture and two laboratory periods a week, first semester.

(This is a semester course: offered once a year.)

Course 101. Title (3). First and second semesters.

(This is a semester course, repeated each semester, and except for research, seminar, and certain problem courses, must be taken only one semester.)

Course 103, 104. Title (3, 3). Three hours a week, first and second semesters.

If a laboratory course:

Course 103, 104. Title (3, 3). One lecture and two laboratory periods a week, first and second semesters.

(This is a course extending through two semesters and carrying three semester credits each semester.)

Course 103, 104. Title (3, 3). Three hours a week, second and first semesters.

(This is a course extending through two semesters, but it begins with the second semester.)

Course 105, f, s. Title (3, 3). Three hours a week, first and second semesters.

(This is alternate way of listing a two-semester course.)

# AGRICULTURAL ECONOMICS AND MARKETING

FOR GRADUATES AND ADVANCED UNDERGRADUATES

- A. E. 100. Farm Economics (3). First semester. Prerequisites, Econ. 31, 32, or Econ. 37.
- A. E. 101. Marketing of Farm Products (3). Second semester. Prerequisites, Econ. 31, 32, or Econ. 37.

- A. E. 103. Cooperation in Agriculture (3). First semester. Poffenberger.
- A. E. 104. Farm Finance (3). Second semester. Poffenberger.
- A. E. 105. Food Products Inspection (2). One lecture and one laboratory period a week, second semester.

  Staff.
- A. E. 106. Prices of Farm Products (3). Second semester. Poffenberger.
- A. E. 107. Analysis of the Farm Business (3). One lecture and two laboratory periods a week, first semester. Hamilton.
- A. E. 108. Farm Management (3). Second semester. Hamilton.
- A. E. 109. Research Problems (1-2). First and second semesters.

DeVault.

- A. E. 110. Seminar (1, 1). First and second semesters. Hamilton.
- A. E. 111. Land Economics (3). First semester.

Bohanan.

- A. E. 114. Foreign Trade in Farm Products (3). Second semester. Shull.
- A. E. 115. Marketing of Dairy Products (3). First semester. Beal.
- A. E. 116. Marketing of Fruits and Vegetables (3). Second semester.

  Godwin.

Poultry Marketing Problems. See Poultry Husbandry, P. H. 104.

Egg Marketing Problems. See Poultry Husbandry, P. H. 105.

Poultry Industrial and Economic Problems. See Poultry Husbandry, P. H. 107.

Market Milk. See Dairy Husbandry, D. H. 109.

Livestock Markets and Marketing. See Animal Husbandry, A. H. 150.

Meat and Meat Products. See Animal Husbandry, A. H. 160.

Economics of Consumption. See Economics, Econ. 130.

Economics of Cooperatives. See Economics, Econ. 151.

Advertising Programs and Campaigns. See Business Administration, B. A. 151.

Retail Store Management. See Business Administration, B. A. 154.

# FOR GRADUATES

A. E. 200, 201. Special Problems in Farm Economics (2, 2). First and second semesters. DeVault.

A. E. 202. Seminar (1, 1). First and second semesters. DeVault.

A. E. 203. Research. Credit according to work accomplished. Staff.

A. E. 208. Agricultural Policy (3). Second semester. Beal.

- A. E. 210. Agricultural Taxation (2). First semester Walker.
- A. E. 211. Functional Aspects of Farm Taxation (3). Second semester.

  Two lectures and one laboratory period a week.

  Walker.
- A. E. 212, 213. Land Utilization and Agricultural Production (3, 3). Three hours a week, first and second semesters.
- A. E. 214. Consumption of Farm Products and Levels of Living (3).

  Second semester. Baker.
- A. E. 215. Advanced Agricultural Cooperation (3). First semester.

  Poffenberger.
- A. E. 216. Advanced Farm Management (3). Second semester.
- A. E. 218. Agricultural Economics Research Techniques (2). Second semester. Godwin
- A. E. 219. Advanced Land Economics (3). First semester. Johnson.

# AGRICULTURAL EDUCATION AND RURAL LIFE

FOR GRADUATES AND ADVANCED UNDERGRADUATES

- R. Ed. 107. Observation and Analysis of Teaching for Agricutural Students
   (3). Two lectures and one laboratory period a week, second semester.
   Murray.
- R. Ed. 109. Teaching Secondary Vocational Agriculture (3). First semester.

  Ahalt, Murray.
- R. Ed. 111. Teaching Young and Adult Farmer Groups (1). First semester.

  Murray.
- R. Ed. 112. Departmental Management (1). One laboratory period a week, second semester. Prerequisites, R. Ed. 107, 109. Murray.
- R. Ed. 114. Rural Life and Education (3). Second semester. Ahalt.

## FOR GRADUATES

- R. Ed. 201, 202. Rural Life and Education (3, 3). Three hours a week, first and second semesters. Prerequisite, R. Ed. 114, or equivalent. Ahalt.
- R. Ed. 207, 208. Problems in Vocational Agriculture (2, 2). Two hours a week, first and second semesters.
  Ahalt.
- R. Ed. 220. Field Problems in Rural Education (1-3). First and second semesters. Prerequisite, six semester hours of graduate study.

  Ahalt, Murray.
- R. Ed. 250. Seminar in Rural Education (1-2). First and second semesters.
- R. Ed. 251. Research. Credit according to work done. Staff.

# AGRONOMY—CROPS AND SOILS

# A. Crops

# FOR GRADUATES AND ADVANCED UNDERGRADUATES

- Agron. 103. Crop Breeding (2). First semester. Prerequisite, Zool. 104. Ronningen.
- Agron. 105. Tobacco Production (2). First semester. Two lectures a week. Prerequisite, Agron. 1.
- Agron. 106. Tobacco Production (2). Second semester. Two lectures a week. Prerequisite, Agron. 105.
- Agron. 151. Cropping Systems (2). Second semester. Kuhn.
- Agron. 152. Seed Production and Distribution (3). Second semester. Two lectures and one laboratory (2 hr.) period a week. Prerequisite, Agron. 1.

## FOR GRADUATES

- Agron. 201. Crop Breeding (2-4). First semester. Prerequisite, consent of instructor. Ronningen.
- Agron. 203. Seminar (1, 1). First and second semesters. Staff.
- Agron. 204. Technic in Field Crop Research (2). First semester. Kuhn.
- Agron. 205. Advanced Tobacco Production (2). Second semester. Two lectures a week. Prerequisite, consent of instructor. Street.
- Agron. 206, 207. Recent Advances in Agronomy (2, 2). First and second semesters. Two lectures a week. Prerequisite, consent of instructor. Kuhn, Street, Ronningen, Burger.
- Agron. 208. Research Methods in Agronomy (2-4). Second semester.

  Prerequisite, consent of staff.

  Staff.

Staff.

Agron. 209. Research (4-8). First and second semesters.

# B. Soils

# FOR GRADUATES AND ADVANCED UNDERGRADUATES

- Soils 102. Soil Classification (3). First semester. Two lectures and one three-hour laboratory period a week. Prerequisites, Soils 1 and Geology 1. (Lecture Nikiforoff; Lab. Thomas.)
- Soils 103. Soil Geography (3). Second semester. Two lectures and one two-hour laboratory period a week. Prerequisite, Soils 102. Nikiforoff.
- Soils 112. Soil Conservation (3). First semester. Two lectures and one three-hour laboratory period a week. Prerequisite, Soils 1. Thomas.
- Soils 120. Soil Management (3). Second semester. Three lectures and discussion periods a week. Prerequisites, Soils 2 and Soils 103. Thomas.

## FOR GRADUATES

- Soils 201. Special Problems and Research (10-12). First and second semesters. Laboratory and library work. Staff.
- Soils 202, 203. Soil Science (3, 3). First and second semesters. Three discussion periods a week. Prerequisite, approval of instructor.

  First semester, Axley; second semester, Thomas.
- Soils 212, 213. Soil Research Technique (2, 2). First and second semesters.

  Two three-hour laboratory periods a week. Prerequisite, approval of instructor.

  Thomas and Axley.
- Soils 220. Soil Seminar (1). First and second semesters. Staff.

# ANIMAL HUSBANDRY

## FOR GRADUATES AND ADVANCED UNDERGRADUATES

- A. H. 111. Animal Nutrition (3). First semester. Prerequisite, Chem. 31, 32, 33, 34; A. H. 110. Graduate credit allowed with permission of instructor.
- A. H. 120. Principles of Breeding (3). Second semester. Two lectures and one laboratory period a week. Prerequisite, Zool. 104. Graduate credit, 1-3 hours, allowed with permission of instructor. Green.
- A. H. 150. Livestock Markets and Marketing (2). First semester. Prerequisite, A. H. 1. Graduate credit allowed with permission of instructor. Kerr.

#### FOR GRADUATES

- A. H. 200, 201. Special Problems in Animal Husbandry (1-2, 1-2). First and second semesters. Work assigned in proportion to amount of credit. Prerequisite, approval of staff.
- A. H. 202, 203. Seminar (1, 1). First and second semesters. Staff.
- A. H. 204. Research (1-6). First and second semesters. Credit to be determined by amount and character of work done. Staff.
- A. H. 205. Advanced Breeding (2). Second semester. Prerequisite, Zool. 104; A. H. 120; one course in biological statistics. Green.
- A. H. 206. Advanced Livestock Management (3). First semester. Two lectures and one laboratory period a week. Prerequisite, approval of staff.

  Staff.

## BACTERIOLOGY

## FOR GRADUATES AND ADVANCED UNDERGRADUATES

Bact. 101. Pathogenic Bacteriology (4). Two lecture and two laboratory periods a week, first semester. Laboratory fee, \$10.00. Prerequisite, Bact. 5.

- Bact. 103. Serology (4). Two lecture and two laboratory periods a week, second semester. Laboratory fee, \$10.00. Prerequisite, Bact, 101.

  Faber.
- Bact. 104. History of Bacteriology (1). One lecture period a week, first semester. Prerequisite, a major or minor in bacteriology. Doetsch.
- Bact. 105. Clinical Methods (4). Two lecture and two laboratory periods a week, first semester. Laboratory fee, \$10.00. Prerequisite, Bact. 103.

  Faber.
- Bact. 108. Epidemiology and Public Health (3). Three lecture periods a week, second semester. Prerequisite, Bact. 101. Faber.
- Bact. 131. Food Bacteriology (4). Two lecture and two laboratory periods a week, first semester. Laboratory fee, \$10.00. Prerequisite, Bact. 5.

  Laffer.
- Bact. 133. Dairy Bacteriology (4). Two lecture and two laboratory periods a week, first semester. Laboratory fee, \$10.00. Prerequisite, Bact. 5.
- Bact. 135. Soil Bacteriology (4). Two lecture and two laboratory periods a week, second semester. Laboratory fee, \$10.00. Prerequisite, Bact. 5.

  Hansen.
- Bact. 161. Systematic Bacteriology (4). Two lecture and two laboratory periods a week, first semester. Laboratory fee, \$10.00. Prerequisite, 16 credits in bacteriology.
- Bact. 181. Bacteriological Problems (3). First and second semesters. Prerequisite, 16 credits in bacteriology. Laboratory fee, \$10.00. Registration only upon the consent of the instructor. Staff.

## FOR GRADUATES

- Bact. 201. Advanced Pathogenic Bacteriology (4). Two lecture and two laboratory periods a week, first semester. Laboratory fee, \$10.00. Prerequisite, 30 credits in bacteriology and allied fields, including Bact. 103.

  Laffer.
- Bact. 204. Bacterial Metabolism (2). Two lecture periods a week, first semester. Prerequisite, 30 credits in bacteriology and allied fields, including. Chem. 161 and 162.

  Pelczar.
- Bact. 206, 208. Special Topics (1, 1). One lecture period a week, first and second semesters. Prerequisite, 20 credits in bacteriology. Staff.
- Bact. 210. Virology (1). One lecture period a week, second semester.

  Prerequisite, Bact. 101 or equivalent.

  Warren.
- Bact. 211. Virology Laboratory (2). One lecture and one laboratory period a week, second semester. Prerequisite, Bact. 101 or equivalent. Registration only upon consent of instructor.

  Smadel.

- Bact. 231. Advanced Food Bacteriology (4). Two lecture and two laboratory periods a week, first semester. Laboratory fee, \$10.00. Prerequisite, 30 credits in bacteriology, including Bact. 131.
- Bact. 280. Seminar (1). First and second semesters. Prerequisite, 30 credits in bacteriology. Staff.
- Bact. 291. Research. First and second semesters. Laboratory fee, \$10.00. Prerequisite, 30 credits in bacteriology.

# BOTANY

# A. Plant Physiology

# FOR GRADUATES AND ADVANCED UNDERGRADUATES

- Bot. 101. Plant Physiology (4). First semester. Two lectures and two laboratory periods a week. Prerequisites, Bot. 1, and general chemistry. Laboratory fee, \$5.00.
- Bot. 102. Plant Ecology (3). Second semester. Two lectures and one laboratory period a week. Prerequisites, Bot. 11, or equivalent. Laboratory fee, \$5.00.

  Brown.

# FOR GRADUATES

- Bot. 201. Plant Biochemistry (4). First semester. Prerequisites, Bot. 101, and elementary organic chemistry, or equivalent. Laboratory fee, \$5.00.

  Gauch.
- Bot. 202. Plant Biophysics (2). First semester. Not given 1950-1951. Prerequisites, Bot. 101, and elementary physics, or equivalent. Gauch.
- Bot. 203. Biophysical Methods (2). First semester. Not given 1950-1951.To accompany Bot. 202. Same prerequisites. Laboratory fee, \$5.00.
- Bot. 204. Growth and Development (2). Second semester. Not given 1950-1951. Prerequisite, 12 semester hours of plant science.
- Bot. 205. Mineral Nutrition of Plants (2). Second semester. Prerequisite, Bot. 101, or equivalent. Gauch.
- Bot. 206. Research in Plant Physiology. Credit according to work done.

  Gauch.
- Bot. 207. Special Topics in Plant Physiology (2). Second semester. Prerequisite, permission of instructor. Not given in 1950-51.
- Bot. 208. Seminar in Plant Physiology (1). Second semester. Prerequisite, permission of instructor. Gauch.

# B. General Botany and Morphology

# FOR GRADUATES AND ADVANCED UNDERGRADUATES

Bot. 111. Plant Anatomy (3). One lecture and two laboratory periods a week, first semester. Prerequisite, Bot. 110, or equivalent. Laboratory fee, \$5.00.

- Bot. 113. Plant Geography (2). First semester. Prerequisite, Bot. 1, or equivalent. Brown.
- Bot. 114. Advanced Plan Taxonomy (3). First semester. One lecture and two laboratory periods a week. Prerequisite, Bot. 11, or equivalent. Laboratory fee, \$5.00.
- Bot. 115. Structure of Economic Plants (3). Second semester. One lecture and two laboratory periods a week. Prerequisite, Bot. 111. Laboratory fee, \$5.00.
- Bot. 116. History and Philosophy of Botany (1). First semester. Prerequisite, 15 semester hours of botany. Bamford.
- Bot. 117. Plant Breeding (2). Second semester. Prerequisites. Zool. 104, or equivalent. D. T. Morgan.
- Bot. 133. Bryophytes and Pteridophytes (3). Second semester. One lecture and two laboratory periods a week. Prerequisites Bot. 1, Bot. 2, or equivalent. Laboratory fee, \$5.00.
- Bot. 135. Aquatic Plants (3). First semester. One lecture and two laboratory periods a week. Prerequisites, Bot. 1, Bot. 11 or equivalent. Laboratory fee, \$5.00.

  Owens.
- Bot. 151S. Teaching Methods in Botany (2). Summer. Prerequisite, Bot. 1, or equivalent. Laboratory fee, \$5.00.

# FOR GRADUATES

- Bot. 211. Cytology (4). Two lectures and two laboratory periods a week, second semester. Prerequisites, Bot. 110, Zool. 104. Laboratory fee, \$5.00.

  Bamford, D. T. Morgan.
- Bot. 212. Plant Morhpology (3). First semester. One lecture and two laboratory periods a week. Prerequisites, Bot. 11, Bot. 111, or equivalent. Laboratory fee, \$5.00.
- Bot. 213. Seminar in Plant Cytology and Morphology (1). First and second semesters. Prerequisite, permission of instructor.

Morgan, Rappleye

- Bot. 214. Research in Plant Cytology and Morphology. Credit according to work done. Bamford, D. T. Morgan.
- Bot. 215. Plant Cytogenetics (3). First semester. Prerequisites, Zool. 104, Bot. 211. Laboratory fee, \$5.00. D. T. Morgan.
- Bot. 219. Special Topics in Plant Morphology and Cytology (2). First semester. Prerequisite, permission of instructor.

# C. Plant Pathology

# FOR GRADUATES AND ADVANCED UNDERGRADUATES

Bot. 122. Research Methods in Plant Pathology (2). First and second semesters. Two laboratory periods a week. Prerequisite, Bot. 20, or equivalent. Laboratory fee, \$5.00.

- Bot. 123. Diseases of Ornamental Plants (2). Not given 1950-1951. Prerequisite, Bot. 20, or equivalent.

  Jeffers.
- Bot. 124. Diseases of Tobacco and Agronomic Crops (2). First semester.

  Prerequisite, Bot. 20, or equivalent.

  O. D. Morgan.
- Bot. 125. Diseases of Fruit Crops (2). Not given 1950-1951. Prerequisite, Bot. 20, or equivalent. Weaver.
- Bot. 126. Diseases of Vegetable Crops (2). Second semester. Prerequisite, Bot. 20, or equivalent.
- Bot. 128. Mycology (4). Second semester. Two lectures and two laboratory periods a week. Prerequisite, Bot. 2, or equivalent. Laboratory fee, \$5.00.
- Bot. 152S. Field Plant Pathology (1). Summer, first three weeks. Laboratory fee, \$5.00. Prerequisite, Bot. 20, or equivalent. Cox, Staff.

- Bot. 221. Virus Diseases (3). Second semester. Two lectures and one laboratory period a week. Prerequisites, Bot. 20, 101. Laboratory fee, \$5.00.
- Bot. 222. Plant Nematology (2). Not given 1950-1951. Two lectures. Prerequisite, Bot. 20, or equivalent.
- Bot. 225. Research in Plant Pathology. Credit according to work done.

  Staff.
- Bot. 226. Plant Disease Control (3). First semester. Prerequisite, Bot. 20 or equivalent. Cox.
- Bot. 229. Seminar in Plant Pathology (1). First and second semesters.

  Jeffers, Cox.
- Bot. 228. Special Topics in Plant Pathology (2). Seceond semester. Prerequisite, permission of instructor.

# BUSINESS AND PUBLIC ADMINISTRATION

#### A. Business Administration

- B. A. 129. Apprenticeship in Accounting (1).
- B. A. 130. Elements of Business Statistics (3). First and second semesters.
- B. A. 131. Statistics Laboratory.
- B. A. 132, 133. Advanced Business Statistics (3, 3). Three hours a week, first and second semesters. Prerequisite, B. A. 130.
- B. A. 140. Financial Management (3). Second semester. Prerequisite, Econ. 140.

- B. A. 141. Investment Management (3). First semester. Prerequisite, B. A. 140.
- B. A. 142. Banking Policies and Practices (3). Second semester. Prerequisite, Econ. 140.
- B. A. 143. Credit Management (3). Second semester. Prerequisite, B. A. 140.
- B. A. 147. Business Cycles (3). Second semester. Prerequisite, Econ. 140.
- B. A. 150. Marketing Management (3). Second semester. Prerequisite, Econ. 150.
- B. A. 151. Advertising Programs and Campaigns (2). First semester. Prerequisite, B. A. 150.
- B. A. 152. Advertising Copy Writing and Layout (2). Second semester. Prerequisite, B. A. 151.
- B. A. 153. Purchasing Management (3). First semester. Prerequisite, B. A. 150.
- B. A. 154. Retail Store Management (3). Second semester. Prerequisite, Econ. 150.
- B. A. 157. Foreign Trade Procedure (3). Prerequisite, B. A. 150.
- B. A. 160. Personnel Management (3). Second semester. Prerequisite, Econ. 160.
- B. A. 162. Contemporary Trends in Labor Relations (3). First semester. Prerequisite, B. A. 160.
- B. A. 163. Industrial Relations (3). Second semester. Prerequisite, Econ. 160.
- B. A. 164. Recent Labor Legislation and Court Decisions (3). Second semester. Prerequisite, Econ. 160. B. A. 160 recommended.
- B. A. 165. Office Management (3). First semester. Prerequisite, B. A. 11 or junior standing.
- B. A. 166. Business Communications (3). Second semester. Prerequisite, junior standing.
- B. A. 167. Job Evaluation and Merit Rating (2). Prerequisite, B. A. 160.
- B. A. 169. Industrial Management (3). Second semester. Prerequisite, B. A. (11) and 160.
- B. A. 170. Transportation I, Regulation of Transportation Services (3). First semester. Prerequisite, Econ. 32 or 37.
- B. A. 171. Transportation II, Services, Rules and Practices (3). Prerequisite, B. A. 170.
- B. A. 172. Transportation III, Motor Transportation (3). Prerequisite, B. A. 171.

- B. A. 173. Transportation IV, Overseas Shipping (3). Prerequisite, B. A. 170.
- B. A. 174. Commercial Air Transportation (3). Prerequisite, B. A. 170.
- B. A. 175. Airline Administration (3). Prerequisite, B. A. 174.
- B. A. 176. Problems in Airport Management (3). Prerequisite, B. A. 174.
- B. A. 177. Motion Economy and Time Study (3). Prerequisite, B. A. 169.
- B. A. 178. Production Planning and Control (2). Prerequisite, B. A. 169.
- B. A. 179. Problems in Supervision (3). Prerequisite, B. A. 169.
- B. A. 180, 181. Business Law (4, 4). First and second semesters. Prerequisite, senior standing. Required in all Bus. Adm. curriculums.
- B. A. 183. Law for Accountants (2). Prerequisite, B. A. 181.
- B. A. 184. Public Utilities (3). Second semester. Prerequisite, Econ. 32 and 37 or senior standing.
- B. A. 189. Government and Business (3). First semester. Prerequisite, Econ. 32 or 37. Senior standing.
- B. A. 190. Life Insurance (3). First semester. Prerequisite, Econ. 32 or 37.
- B. A. 191. Property (3). Second semester. Prerequisite, Econ. 32 or 37.
- B. A. 194. Insurance Agency Management (3). First semester. Prerequisite, B. A. 190 or 191.
- B. A. 195. Real Estate Principles (3). First semester. Prerequisite, Econ. 32 or 37.
- B. A. 196. Real Estate Finance (3). Second semester. Prerequisite, Econ. 32 or 37.
- B. A. 197. Real Estate Management (3). Second semester. Prerequisite, B. A. 195 or 196.
- B. A. 210. Advanced Accounting Theory. (2, 3).
- B. A. 220. Managerial Accounting (3).
- B. A. 221, 222. Seminar in Accounting. Arranged.
- B. A. 226. Accounting Systems (3).
- B. A. 228. Research in Accounting.
- B. A. 229. Studies of Special Problems in the Fields of Control and Organization.
- B. A. 240. Seminar in Financial Management (1-3).
- B. A. 249. Studies of Special Problems in the Field of Financial Administration. Arranged.

- B. A. 250. Problems in Sales Management (1-3).
- B. A. 251. Problems in Advertising (3).
- B. A. 252. Problems in Retail Store Management (3).
- B. A. 257. Seminar in Marketing Management.
- B. A. 258. Research in Marketing.
- B. A. 259. Studies of Special Problems in the Field of Marketing Policies, Management and Administration. Arranged.
- B. A. 262. Seminar in Contemporary Trends in Labor Relations.
- B. A. 265. Development and Trends in Modern Industrial Management (3).
- B. A. 266. Research in Personnel Management.
- B. A. 267. Research in Industrial Relations.
- B. A. 269. Studies of Special Problems in Employer-Employee Relationships. Arranged.
- B. A. 270. Seminar in Air Transportation (3).
- B. A. 271. Theory of Organization (3).
- B. A. 277. Seminar in Transportation (3).
- B. A. 280. Seminar in Business and Government Relationships.
- B. A. 284. Seminar in Public Utilities (3).
- B. A. 290. Seminar in Insurance (3).
- B. A. 295. Seminar in Real Estate (3).
- B. A. 299. Thesis.

#### B. Economics

- Econ. 131. Comparative Economic Systems (3). Second semester. Prerequisite, Econ. 32 or 37.
- Econ. 132. Advanced Economic Principles (3). First semester. Prerequisite, Econ. 32.
- Econ. 134. Contemporary Ecnomic Thought (3). Second semester. Prerequisite, Econ. 32.
- Econ. 136. International Economic Policies and Relations (3). First semester. Prerequisite, Econ. 32 or 37. Econ. 131 recommended.
- Econ. 137. The Economics of National Planning (3). Second semester. Prerequisite, Econ. 32 or 37. An analysis of the principles and practice of economic planning with special reference to the planning problems of Great Britain, Russia and the United States.
- Econ. 140. Money and Banking (3). First semester. Prerequisite, Econ. 32 or 37.

- Econ. 141. Theory of Money, Credit, and Prices (3). Second semester. Prerequisites, Econ. 32 and 140.
- Econ. 142. Public Finance and Taxation (3). First semester. Prerequisite, Econ. 32 or 37.
- Econ. 149. International Finance and Exchange (3). Second semester. Prerequisite, Econ. 140. Econ. 136 and 141 recommended.
- Econ. 150. Marketing Principles and Organization (3). First semester. Prerequisite, Econ. 32 or 37.
- Econ. 151. Economics of Cooperatives (2). Second semester. Prerequisite, Econ. 32 or 37.
- Econ. 160. Labor Economics (3). First semester Prerequisite, Econ. 32 or 37.
- Econ. 170. Monoply and Competition (3). Second semester. Prerequisite, Econ. 32 or 37.
- Econ. 171. Economics of American Industry (3). Second semester. Prerequisite, Econ. 32 or 37.

- Econ. 230. History of Economic Thought (3). First semester. Prerequisite, Econ. 132.
- Econ. 231. Economic Theory in the Nineteenth Century (3). Second semester. Prerequisite, Econ. 230 or consent of instructor.
- Econ. 235. Seminar in International Economic Relations (3).
- Econ. 237. Seminar in Economic Investigation (3). First semester.
- Econ. 270. Seminar in Economics and Geography of American Industries (3).
- Econ. 299. Thesis. Arranged

# C. Geography

# FOR GRADUATES AND ADVANCED UNDERGRADUATES

Geog. 100, 101. Regional Geography of the United States and Canada (3, 3). First and second semesters. Prerequisites, Geog. 1, 2 or Geog. 60, 61 or permission of instructor.

The climate, land forms, soils and minerals, forests, agriculture, industries and commerce; the people and their occupations by regions. Several all-day field trips are required.

Instructor to be announced.

Geog. 102. The Geography of Manufacturing in the United States and Canada (3). First semester.

The geographic factors which are associated with the location of manufacturing industries. One or more field trips. Not given in 1950-51.

Geog. 110, 111. Latin America (3, 3). First and second semesters.

Regional geography of the Latin American republics; an analysis of the physical environment and the natural resources and a survey of the historical and culture development.

Geog. 115. The Peoples of Latin America (2). Second semester.

Population distribution, composition and growth, trends in fertility and mortality; migration, rural-urban and inter-regional, cultural, ethnic and political aspects.

Crist and Lecturer.

Geog. 120. Economic Geography of Europe (3). First semester.

The natural resources of Europe in relation to agricultural and industrial development and to present-day economic and national problems. Van Royen.

Geog. 122. Economic Resources and Development of Africa (3.). Second semester.

The natural resources of Africa in relation to agricultural and mineral production; the various stages of economic development and the potentialities of the future.

Van Royen.

Geog. 123. Problems of Colonial Geography (3). First or second semester.

Problems of development of colonial areas, with special emphasis upon the development of tropical regions and the possibilities of white settlement in the tropics.

Van Royen.

Geog. 130, 131. Economic and Political Geography of Southern and Eastern Asia (3, 3). First and second semesters.

A study of China, Japan, India, Burma, Indo-China and the Dutch East Indies; natural resources, population and economic activities. Comparisons of physical and human potentialities of major regions and of their economic, social and political development.

Geog. 134, 135. Cultural Geography of East Asia (3, 3). First and second semester.

A comprehensive and systematic survey of the geographical distribution and interpretation of the major racial groups and cultural patterns of China, Japan and Korea. Special emphasis will be placed on the unique characteristics of the peoples of these areas, their basic cultural institutions, outlooks on life, contemporary problems and trends of cultural change. Designed especially for students of the social sciences and those preparing for careers in foreign service, foreign trade, education and international relations. Hu.

Geog. 140. Soviet Lands I (3). First semester.

The natural environment, geographic factors in the expansion of the Russian State and the geography of agriculture, of industry and of transport. Political geography of the U.S.S.R.

Morrison.

Geog. 141. Soviet Lands II (3). Second semester.

The regional geography of the U.S.S.R.. Prerequisite, Geog. 140.

Morrison.

Geog. 146. The Near East (3). First semester.

The physical, economic, political and strategic geography of the lands between the Mediterranean and India. Not given in 1950-51. Morrison.

Geog. 150. Problems of Map Evaluation I. Topographic Maps (3). First or second semester. Two hours lecture and two hours laboratory a week. Prerequisite, Geog. 30.

Review of status of topographic mapping with consideration of important schools of topographic concepts and practices. Theoretical and practical means of determining map reliability and utility, including studies of map coverage. Emphasis on methods of preparation of data for compilation purposes, including a study of types of source materials. Methods of map cataloging and bibliography are given brief consideration.

Davies, Geological Survey.

Geog. 151. Problems of Map Evaluation II. Non-Topographic Special-Use Maps (3). First or second semester. Two-hour lecture and two hours laboratory a week. Prerequisite, Geog. 150.

Deals exclusively with non-topographic special-use maps used in the fields of geogolgy, pedology, climatology, forestry and botany, geography, economics, agricultural economics, demography, transportation and communication, military science and certain other special fields. Each type is studied from the viewpoint of history, basic criteria upon which the selection of features and scales is determined, methods of representation and preparation, interpretation and availability of source materials. Field trips when possible.

Brierly, Army Map Service.

Geog. 152. Problems and Practices of Photo Interpretation (3). Off campus. First and second semesters. Two-hour lecture and two hours laboratory a week. Prerequisite, Geog. 31 or equivalent.

Reading and interpretation of aerial photographs with emphasis on topographic features. Study of limitations of photo interpretations. Interpretations of soil, geologic, vegetation and military data.

Geog. 154, 155. General Cartography and Graphics (3, 3). First and second semesters. One lecture and two two-hour laboratory periods a week. Prerequisite, Geog. 30 or consent of instructor.

Problems and techniques of compilation, design, construction and reproduction of the various types of maps and graphic materials. Laboratory exercises are directed primarily toward the solution of actual cartographic problems encountered by the geographer.

Karinen.

Geog. 160. Elementary Toponymy. (3). First and second semesters. Prerequisite, Geog. 30 and one foreign language.

Problems of place-name analysis as related to cartography, especially those involved in making and interpreting foreign maps, the language aspects of gazetteers and the problems of compilation of cartographic dictionaries. The course will close with a review of the linguistic aspects of air

charts, hydrographic charts and the International Map of the World.

Aiken, Army Map Service.

Geog. 162. Fundamentals of Climatology (3). Second semester. Prerequisite, Geog. 41 or consent of instructor.

Introduction to climatology, stressing the causes of the climates in terms of the geography of the globe, radiation balance, motions of the atmosphere, air masses and fronts. Definition and properties of basic statistical concepts employed in climatology.

Thom.

# Geog. 170. Local Field Course (3). First semester.

Training in geographic field methods and techniques. Field observation of land use in selected rural and urban areas in Maryland. One lecture per week with Saturday and occasional week-end field trips. Primarily for undergraduates.

# Geog. 171. Summer Field Course (6). Summer School.

Intensive training in methods and techniques of geographic field observation and recording. Practical experience in conducting land utilization surveys and the preparation of reports. Field study of the location and site factors affecting selected industrial establishments. Water-use problems. For geography majors and for those preparing for careers in regional planning. In 1950 the course will be given in Western Maryland. Staff.

Geog. 180, 181. History, Nature and Methodology of Geography (3, 3). First and second semesters.

A comprehensive and systematic study of the history, nature and basic principles of geography, with special reference to the major schools of geographic thought; a critical evaluation of some of the important geographical works and methods of geographic research.

Hu.

Geog. 190. Political Geography (3). Second semester.

Geographical factors in national power and international relations. "Geopolitics" and "geostrategy." Morrison.

#### FOR GRADUATES

Geog. 210, 211. Seminar in the Geography of Latin America (3, 3). First and second semesters.

An analysis of recent changes and trends in industrial development, exploitation of mineral resources and land utilization. Prerequisite, Geog. 110, 111 or consent of instructor. Crist.

Geog. 220, 221. Seminar in the Geography of Europe and Africa (3, 3). First and second semesters.

Analysis of special problems concerning the resources and development of Europe and Africa. Prerequisite, Geog. 120, 121 or consent of instructor.

Van Royen.

Geog. 230, 231. Seminar in Geography of China (3, 3). First and second semesters.

Analysis of problems concerning the geography of China, with emphasis on techniques peculiar to Chinese geographical research.

Geog. 240, 241. Seminar in the Geography of the U.S.S.R. (3, 3). First and second semesters.

Investigation of special aspects of Soviet geography. Emphasis on the use of Soviet materials. Prerequisite, reading knowledge of Russian and Geog. 140, 141 or consent of instructor.

Morrison.

- Geog. 246. Seminar in the Geography of the Near East (3). Not given in 1950-51. Morrison.
- Geog. 250. Seminar in Cartography. (Credit to be arranged.) First or second semester.

The historical and mathematical background of cartographic concepts, practices and problems and the various philosophical and practical approaches to cartography. Discussions will be supplemented by the presentation of specific cartographic problems investigated by the students. Not given in 1950-51.

Karinen and Davies.

Geog. 260. Micro-Climatology (3). Second semester. Prerequisite, Geog. 162 or consent of instructor.

The climate of the layer of air near the ground in which plants live and related topics.

Thom.

Geog. 261. Advanced General Climatology (3). First semester.

Selected topics in climatology illustrating principles, techniques and the distribution of climate. Prerequisite, Geog. 162 or consent of instructor.

Thom.

Geog. 262, 263. Seminar in Meteorology and Climatology. (3, 3). First and second semesters.

Selected topics in meteorology and climatolgy chosen to fit the individual needs of advanced students. Prerequisite, consent of instructor. Thom.

Geog. 280. Geomorphology (3). Second semester.

An advanced comparative study of selected geomorphic processes and land forms; theories of land forms evolution and geomorphological problems.

Van Royen.

Geog. 290, 291. Visitors' Seminar. (Credit to be arranged.) First and second semesters.

Discussion of special topics with visiting specialists. Problems of geographic research and its administration in Federal agencies. Visitors and Staff.

Geog. 292, 293. Individual Research. (Credit to be arranged.) First and second semesters and summer.

## D. Government and Politics

# FOR GRADUATES AND ADVANCED UNDERGRADUATES

- G. & P. 101. International Political Relations (3). First semester. Prerequisite, G. & P. 1. Plischke.
- G. & P. 102. International Law (3). Second semester. Prerequisite, G. & P. 1.
- G. &. P. 105. Recent Far Eastern Politics (3). First semester. Prerequisite, G. & P. 1. Steinmeyer.
- G. &. P. 106. American Foreign Relations (3). Second semester. Prerequisite, G. &. P. 1. Plischke.
- G. &. P. 110. Principles of Public Administration (3). First semester. Prerequisite, G. & P. 1. Ray.
- G. &. P. 111. Public Personnel Administration (3). First semester. Prerequisite, G. &. P. 1.

  Larsen.
- G. &. P. 112. Public Financial Administration (3). Second semester.

  Prerequisite, G. & P. 1.

  Larsen.
- G. &. P. 124. Legislatures and Legislation (3). Second semester. Prerequisite, G. &. P. 1.

  Burdette.
- G. &. P. 131, 132. Constitutional Law (3, 3). First and second semesters. Prerequisite, G. & P. 1. Dixon.
- G. & P. 133. Administration of Justice (3). Second semester. Prerequisite, G. & P. 1.
- G. & P. 141. History of Political Theory (3). First semester. Prerequisite, G. & P. 1.
- G. & P. 142. Recent Political Theory (3). Second semester. Prerequisite, G. & P. 1.
- G. & P. 144. American Political Theory (3). First semester. Prerequisite, G. & P. 1.
- G. & P. 154. Problems of World Politics (3). Second semester. Prerequisite, G. & P. 1. Steinmeyer.
- G. & P. 174. Political Parties (3). First semester. Prerequisite, G. & P. 1. Burdette.
- G. & P. 178. Public Opinion (3). First semester. Prerequisite, G. & P. 1.

  Burdette.
- G. & P. 181. Administrative Law (3). Second semester. Prerequisite, G. & P. 1. Ray.

#### FOR GRADUATES

G. & P. 201. Seminar in International Political Organization (3).

Plischke.

G. & P. 202. Seminar in International Law (3). Plischke.

- G. & P. 207. Seminar in Comparative Governmental Institutions (3).

  Steinmeyer.

  G. & P. 211. Seminar in Federal-State Relations (3).

  Ray.

  G. & P. 213. Problems of Public Administration (3).

  Ray.
- G. & P. 214. Problems of Public Personnel Administration (3). Larsen.
- G. & P. 216. Government Administrative Planning and Management (3).

  Larsen,
- G. & P. 217. Government Corporations and Special Purpose Authorities (3).
- G. & P. 221. Seminar in Public Opinion (3). Burdette.
- G. & P. 223. Seminar in Legislatures and Legislation (3). Burdette.
- G. & P. 224. Seminar in Political Parties and Politics (3). Burdette.
- G. & P. 225. Man and the State (3). Dixon.
- G. & P. 231. Seminar in Public Law (3). Ray.
- G. & P. 251. Bibliography of Government and Politics (3). Staff.
- G. & P. 261. Research in Government and Politics (3). Staff.
- G. & P. 281. Departmental Seminar (No Credit). Registration for two semesters required of all doctoral candidates. Staff.
- G. & P. 299. Thesis Course (Arranged).

#### CHEMISTRY

Laboratory fees in Chemistry are \$10.00 per course per semester.

#### A. Analytical Chemistry

#### FOR GRADUATES

- Chem. 206, 208. Spectographic Analysis (1, 1). One three-hour laboratory a week. Prerequisite, Chem. 188, 190 and consent of the instructor. Registration limited. Prerequisite, consent of instructor. White.
- Chem. 221, 223. Chemical Microscopy (2, 2). One lecture and three one-hour laboratory period a week, first and second semesters. Registration limited. Prerequisite, consent of instructor. Stuntz.
- Chem. 225. Polarography (2). Two lectures a week.
- Chem. 226, 228. Advanced Quantitative Analysis (2, 2). Two three-hour laboratory periods a week, first and second semesters. Prerequisite, consent of instructor. Stuntz.
- Chem. 266. Biological Analysis (2). Two three-hour laboratory periods a week, second semester. Prerequisites, Chem. 19, 31, 32, 33, 34. Wiley.

# B. Biochemistry

# FOR GRADUATES AND ADVANCED UNDERGRADUATES

- Chem. 161, 163. Biochemistry (2, 2). Two lectures a week, first and second semesters. Prerequisites, Chem. 31, 33, or Chem. 35, 37.
- Chem. 162, 164. Biochemistry Laboratory (2, 2). Two three-hour laboratory periods a week, first and second semesters. Prerequisites, Chem. 32, 34, or Chem. 36, 38.

## FOR GRADUATES

- Chem. 261, 263. Advanced Biochemistry (2, 2). Two lectures a week, first and second semesters. Prerequisites, Chem. 141, 143, or consent of instructor.
- Chem. 262, 264. Advanced Biochemistry Laboratory (2, 2). Two three-hour laboratory periods a week, first and second semesters. Prerequisite, consent of the instructor.
- Chem. 265. Enzymes (2). Two lectures a week first semester. Prerequisites, Chem 161, 163.

  Veitch.
- Chem. 268. Special Problems in Biochemistry (2-4). Two to four three-hour laboratory periods a week, first and second semesters. Prerequisites, Chem. 161, 162, 163, 164 and consent of the instructor. Veitch.

# C. Inorganic Chemistry

#### FOR GRADUATES AND ADVANCED UNDERGRADUATES

Chem. 101. Advanced Inorganic Chemistry (2). Two lectures a week, second semester. Prerequisites, Chem. 23 and 37, 38.

#### FOR GRADUATES

- Chem. 201, 203. The Chemistry of Rarer Elements (2, 2). Two lectures a week, first and second semesters. White.
- Chem. 202, 204. Advanced Inorganic Laboratory (2, 2). Two three-hour laboratory periods a week, first and second semesters.
- Chem. 205. Radiochemistry (2). Two lectures a week. Rollinson.
- Chem. 207. Chemistry of Co-ordination Compounds (2). Two lectures a week.
- Chem. 210. Radiochemistry Laboratory (1 or 2). One or two three-hour laboratory periods a week. Registration limited. Prerequisites, Chem. 205 (or concurrent registration therein) and consent of instructor.

  Rollinson.
- Chem. 239. Physical Techniques in Chemistry (2). A survey of the tools available for the solution of chemical problems by means of physical techniques.

# D. Organic Chemistry

# FOR GRADUATES AND ADVANCED UNDERGRADUATES

- Chem. 141, 143. Advanced Organic Chemistry (2, 2). Two lectures a week, first and second semesters. Prerequisites, Chem. 37, 38.
- Chem. 142, 144. Advanced Organic Laboratory (2, 2). Two three-hour laboratory periods a week, first and second semesters. Prerequisites, Chem. 37, 38.
- Chem. 146. 148. The Identification of Organic Compounds (2, 2). Two three-hour laboratory periods a week, first and second semesters. Prerequisites, Chem. 141, 143, or concurrent registration therein.
- Chem. 150. Organic Quantitative Analysis (2). Two three-hour laboratory periods per week. The semi-micro determination of carbon, hydrogen, nitrogen, halogen and certain functional groups. First and second semesters.

(One or more courses from the following group 241-257 will customarily be offered each semester. Two of these courses will be presented in the academic year (1949-1950).

- Chem. 241. Stereochemistry (2). Two lectures a week. Woods.
- Chem. 243. The Chemistry of Petroleum Processing (2). Two lectures a week, second semester. Prerequisites, Chem. 141, 143, 187, 189. Fischer.
- Chem. 245. The Chemistry of the Steroids (2). Two lectures a week.

Pratt.

- Chem. 249. Physical Aspects of Organic Chemistry (2). Two lectures a week. Woods.
- Chem. 251. The Heterocylics (2). Two lectures a week. Pratt.
- Chem. 253. Organic Sulfur Compounds (2). Two lectures a week. Dewey.
- Chem. 254. Advanced Organic Preparations (2 to 4). Two to four three-hour laboratory periods a week, first and second semesters.
- Chem. 257. Organic Laboratory Methods (2). Two lectures a week.

Pratt.

- Chem. 258. The Identification of Organic Compounds, an Advanced Course (2 to 4). Two to four three-hour laboratory periods a week, first and second semesters.

  Pratt.
- Chem. 260. Advanced Organic Laboratory (1 or 2). One or two three-hour laboratory periods per week, first and second semesters. Pratt.

## E. Physical Chemistry

#### FOR GRADUATES AND ADVANCED UNDERGRADUATES

Chem. 181, 183. Elements of Physical Chemistry (2, 2). Two lectures a week, first and second semesters. Prerequisites, Chem. 19; Phys. 1, 2; Math. 10, 11.

- Chem. 182, 184. Elements of Physical Chemistry Laboratory (1, 1). One three-hour laboratory period a week, first and second semesters. May be taken ONLY when accompanied by Chem. 181, 183.
- Chem. 187, 189. Physical Chemistry (3, 3). Three lectures a week, first and second semesters. Prerequisites, Chem. 19 or 21; Phys. 20, 21; Math. 20, 21.
- Chem. 188, 190. Physical Chemistry Laboratory (2, 2). Two three-hour laboratory periods a week, first and second semesters. A laboratory course for students taking Chem. 187, 189.
- Chem. 192, 194. Glassblowing Laboratory (1, 1). One three-hour laboratory period a week, first and second semesters. Prerequisite, consent of instructor.

The common prerequisites for the following courses are Chem. 187, 189, and 188, 190, or their equivalent.

One or more courses of the group, 281-307, will be offered each semester, depending on demand.

- Chem. 281, 283. Theory of Solutions (2, 2). Two lectures a week, first and second semesters. Prerequisite, Chem. 307. Svirbely.
- Chem. 285. Colloid Chemistry (2). Two lectures a week. Pickard.
- Chem. 287. Infra-red and Raman Spectroscopy (2). Two lectures a week second semester. Prerequisites, Chem. 141, 143, 187, 189. Spurr.
- Chem. 295. Heterogenous Equilibria (2). Two lectures a week. Pickard.
- Chem. 299. Reaction Kinetics (3). Three lectures per week. Svirbely.
- Chem. 303. Electrochemistry (3). Three lectures a week. Pickard.
- Chem. 304. Electrochemistry Laboratory (2). Two three-hour laboratory periods a week. Prerequisite, consent of instructor. Staff.
- Chem. 307 Chemical Thermodynamics (3). Three lectures a week.

  Svirbely.
- Chem. 311. Physicochemical Calculations (2). Two lectures per week.

  Pickard.
- Chem. 313 Molecular Structure (2). Two lectures per week. Brown.
- Chem. 321. Quantum Chemistry (3). Three lectures a week. Brown.
- Chem. 323. Statistical Mechanics and Chemistry (3) Three lectures a week.

## F. Seminar and Research

- Chem. 351. Seminar (1). First and second semesters. Staff.
- Chem. 360. Research. First and second semesters, summer session. Staff.

## COMPARATIVE LITERATURE

## FOR GRADUATES AND ADVANCED UNDERGRADUATES

- Comp. Lit. 101. Introductory Survey of Comparative Literature (3). First semester. Zucker.
- Comp. Lit. 102. Introductory Survey of Comparative Literature (3).

  Second semester. Zucker.
- Comp. Lit. 103. The Old Testament as Literature (3). Second semester.

  Zucker.
- Copm. Lit. 104. Chaucer (3). First semester. Same as Eng. 104.

  Harman.
- Comp. Lit. 105. Romanticism in France (3). First semester. Staff.
- Comp. Lit. 106. Romantisicm in Germany (3). Second semester. Prahl.
- Comp. Lit. 107. The Faust Legend in English and German Literature (3).

  First semester. Prahl.
- Comp. Lit. 108. Some Non-English Influences on American Literature (3).

  Second semester. Zucker.
- Comp. Lit. 109. Cervantes (3). Second semester. Staff.
- Comp. Lit. 112. Ibsen (3) First semester. Zucker.
- Comp. Lit. 113. Prose of the Renaissance (3). Second semester. Same as Eng. 113. (Not offered in 1949-1950.) Zeeveld.
- Comp. Lit. 114. The Greek Drama (3). First semester. Prahl.
- Comp. Lit. 121. Milton (3). Same as Eng. 121. Murphy.
- Comp. Lit. 125. Literature of the Middle Ages (3). Second semester.

A study of the spirit of the Middle Ages at the hand of translations of medieval epics, lyrics and dramas.

Comp. Lit. 129, 130 Literature of the Romantic Period (3, 3) Three hours a week, first and second semesters. Same as Eng. 129, 130.

Weber.

- Comp. Lit. 131, 132. History of the Theatre (3, 3). First and second semesters. Same as Speech 131, 132. Niemeyer.
- Comp. Lit. 144. Modern Drama (3). First semester. Same as Eng. 144. Weber.
- Comp. Lit. 145. The Modern Novel (3). Second semester. Same as Eng. 145. Cardwell.
- Comp. Lit. 155, 156. Four Major American Writers (3, 3). Three hours a week, first and second semesters. Same as Eng. 155, 156. Gravely.

- Comp. Lit. 201. Bibliography and Methods (3). First semester. Same as Eng. 201. Mooney.
- Comp. Lit. 203. Schiller (3). Same as German 204. Prahl.
- Comp. Lit. 204. Medieval Romances (3). First semester. Same as Eng. 204. (Not offered in 1949-1950.)
- Comp. Lit. 205. Georges Duhamel, Poet, Dramatist, Novelist (3). First semester. Same as French 204. Falls.
- Comp. Lit. 206, 207. Seminar in Sixteenth Century Literature (3, 3). First and second semesters. Same as Eng. 206 and 207. McManaway.
- Comp. Lit. 208. The Philosophy of Goethe's Faust (3). Same as German 208. Zucker.
- Comp. Lit. 216, 217. Literary Criticism (3, 3). Three hours a week, first and second semesters. Same as Eng. 216, 217. Staff.
- Comp. Lit. 227, 228. Problems in American Literature (3, 3). Same as Eng. 227, 228. (Not offered in 1949-1950.)

## DAIRY

- Dairy 101, Dairy Production (3). Two lectures and one laboratory period a week second semester. Prerequisites, Dairy 1 and A. H. 110. Cairns.
- Dairy 105, Dairy Cattle Breeding (3). Two lectures and one laboratory period a week first semester. Prerequisites, Dairy 1, Zool. 104 and A. H. 120. Cairns, Ellmore.
- Dairy 108. Dairy Technology (4). Two lectures and two laboratory periods a week, first semester. Prerequisites, Dairy 1, Bact. 133, Chem. 1, 3. Laboratory fee, \$3.00.
- Dairy 109. Market Milk (4). Two lectures and two laboratory periods a week, first semester. Prerequisites, Dairy 1, Bact. 133, Chem. 1, 3. Laboratory fee, \$3.00.

  Arbuckle, Nisonger.
- Dairy 110. Butter and Cheese Making (4). Two lectures and two laboratory periods a week, second semester. Laboratory fee, \$3.00. Prerequisites, Dairy 1, Bact. 1, Chem. 1, 3. (Alternate years given in 1950-1951.)

  Mattick.
- Dairy 111. Concentrated Milk Products (2). One lecture and one laboratory period a week, second semester. Prerequisites, Dairy 108, 114. (Alternate years not given in 1950-1951.) Laboratory fee, \$3.00.

Mattick.

Dairy 112. Ice Cream Making (4). Two lectures and two laboratory periods a week, second semester. Laboratory fee, \$3.00. Prerequisites, Dairy 108.

Arbuckle, Nisonger.

- Dairy 114. Special Laboratory Methods (4). Two lectures and two laboratory periods a week, second semester. Prerequisites, Dairy 108, Bact. 133, Chem. 19, 31, 32, 33, 34. Laboratory fee, \$3.00. Arbuckle.
- Dairy 201. Advanced Dairy Production (3). First semester. Prerequisite, Dairy 101, or equivalent. Cairns.
- Dairy 202. Advanced Dairy Technology (3). First semester. Prerequisites, Dairy 108, 114 or equivalent. Arbuckle.
- Dairy 203. Physiology of Milk Secretion (3). Two lectures and one laboratory period a week, second semester. Prerequisites, A. H. 111 and consent of instructor.
- Dairy 204. Special Problems in Dairying (1-5). First and second semesters. Prerequisite, permission of professor in charge of work. Staff.
- Dairy 205. Seminar (1). First and second semesters. Staff.
- Dairy 206. Animal Nutrition Seminar (1). Second semester. Prerequisites, permission of instructor.
- Dairy 208. Research (3-8). Credit to be determined by amount and quality of work done. Staff.

# **EDUCATION**

# Special Departmental Requirements and Information

MASTER OF ARTS AND MASTER OF EDUCATION

A student in Education has the option of qualifying for the degree of Master of Arts or for the degree of Master of Education.

In addition to the general requirements for admission to the Graduate School, applicants for unconditional admission with a major in Education must have had sixteen semester hours of undergraduate work in Education of acceptable quality, equivalent in character to the work required in the junior and senior years of the University of Maryland. The Education Committee on Masters' Progams may interpret this requirement so that foundation work in fields other than education may be accepted in cases of graduate students not preparing for school work.

Students who do not complete the requirements for the Master's degree in Education within six years of the date of matriculation may be required to take supplementary course work at the rate of two semester hours for each year the completion of the course requirements is deferred beyond six years, or to take special examinations based upon up-to-date materials in courses more than six years old.

A qualifying written examination is required of all candidates for a degree, to be taken after the student has successfully completed twelve semester hours of satisfactory graduate work. This examination covers the student's major area of work for the degree. For a list of the areas in which this examination may be taken, see the statement issued separately

by the Department of Education. To assist in the choice of reading in preparation for the examination, reading lists in the several areas are available in the office of the College of Education. Currently the examination is administered on the third Saturday of January and May and on the Saturday preceding the last week of the Summer Session at College Park only.

Candiates for the degree of Master of Education who are high school teachers not preparing for administrative positions are advised to take at least twelve semester hours in their subject fields.

# DOCTORAL DEGREES

The Department of Education offers work towards degrees of Doctor of Philosophy and Doctor of Education.

Each candidate is required to achieve exceptional ability in at least one major area of competence. For the Ph.D., he must, in addition, achieve competence in at least one minor area outside the field of education. For both degrees, the candidate is required to develop competence in approximately six areas, including the major and minor. The choice of specific areas is optional with the student and his faculty adviser.

The areas of specialization in education from which a student may select his major, his minor, and approximately four other areas of competence, are as follows:

Adult Education
Curriculum and Instruction
Educational Administration and
Supervision
Elementary Education
Guidance and Personnel
Health and Physical Education
Higher Education
History, Philosophy, and

Comparative Education

Home Economics Education
Human Growth and Development
Industrial Arts Education
Nursery School Education
Research Principles and Techniques
Secondary Education
Vocational-Industrial Education

In addition to the general University requirements for a doctor's degree the following additional requirements must be met by students proposing to major in one of the above fields.

- 1. The preliminary examination for admission to candidacy for the doctor's degree will cover the student's preparation in major and minor fields, and will include such other examinations as may be required by the faculty. A student must be admitted to candidacy in order to have the department's official permission to be a candidate for a doctor's degree.
- 2. A comprehensive examination covering the general fields of major and minor study must be passed by each candidate, after which the final examination is administered by a committee appointed by the Dean of the Graduate School.

3. In order to meet the residence requirements, a candidate for the Ph. D. degree must spend at least two semesters in full time study on the College Park campus.

In general the requirements for the Doctor of Education degree are the same as those for the degree Doctor of Philosophy. The most important difference between the two degrees are as follows:

- 1. The purpose of the Doctor of Education degree is to prepare persons of exceptional competence to work in the field. The emphasis for this degree is placed on broad understanding, whereas that for the degree of Doctor of Philosophy is placed on specialized research.
- 2. A reading knowledge of foreign languages is required for the degree of Doctor of Education only when needed for research and study in the doctoral program.
- 3. In meeting residence requirements, a candidate for the Ed.D. degree may substitute two summers of residence for one semester of residence or four summers for two semesters.
- 4. The doctoral study for the Ed. D. consists of a project rather than a dissertation. The project requires research to meet a practical field problem. Credit of six to nine hours is allowed for a project as compared with twelve to eighteen hours for a Ph.D. dissertation.

# A. History, Principles, Curriculum, and Administration FOR GRADUATES AND ADVANCED UNDERGRADUATES

- Ed. 100. History of Education I (2). First semester Wiggin.
- Ed. 101. History of Education II (2).
- Ed. 102. History of Education in the United States (2). Second semester. Wiggin.
- Ed. 105. Comparative Education—European (2). First semester.

Benjamin.

- Ed. 106. Comparative Education—Latin America (2). Second semester.

  Beniamin.
- Ed. 107. Philosophy of Education I (2).
- Ed. 108. Philosophy of Education II (2).
- Ed. 110. The Teacher and School Administration (2).
- Ed. 121. The Language Arts in the Elementary School (2).
- Ed. 122. The Social Studies in the Elementary School (2).
- Ed. 123. The Child and the Curriculum (2).
- Ed. 124. Creative Expression in the Elementary School (2).

- Ed. 125. Creative Expression in the Elementary School II (2). Prerequisite, Ed. 124 or taken concurrently.
- Ed. 126. The Elementary School Curriculum (2).
- \*Ed. 130. Theory of the Junior High School (2).

Newell.

\*Ed. 131. Theory of the Senior High School (2).

Newell.

- Ed. 133. Methods of Teaching the Social Studies (2). Offered in Baltimore.
- Ed. 134. Materials and Procedures for the Senior High School Core Curriculum (2).
- Ed. 137. Science in the Junior High School (2). Laboratory fee, \$2.00.
- Ed. 140. Curriculum, Instruction, and Observation (3). Second semester.

  Staff.

Graduate credit is allowed only by special permission. Separate sections are offered in the following subject-matter areas: English, Social Studies, Foreign Languages, Science, Mathematics, Art Education, Business Education, Industrial Education, Music Education, Nursing Education, Physical Education for Men, and Physical Education for Women.

- Ed. 141. High School Course of Study-English (2). Bryan.
- Ed. 142. High School Course of Study-Literature (2). Bryan.
- Ed. 144. Materials and Procedure for the Junior High School Core Curriculum (2).
- Ed. 145. Principles of High School Teaching (2). First and second semesters.

  Brechbill.
- Ed. 146. The Teaching of Physics (3). Second semester. Laboratory fee, \$6.00. R. Morgan
- Ed. 147. Audio-Visual Education (2). First semester. Laboratory fee, \$1.00.
- Ed. 150. Educational Measurement (2). First and second semesters.

  Brechbill.
- Ed. 151. Remedial Reading Instruction (2). Schindler.
- Ed. 152. The Adolescent: Characteristics and Problems (2).
- Ed. 153. The Improvement of Reading (2). Schindler.
- Ed. 160. Educational Sociology—Introductory (2). First and second semesters. Schindler.
- Ed. 161. Guidance in Secondary Schools (2).

<sup>\*</sup> Credit is accepted for Ed. 130 or for Ed. 131, but not for both courses.

- Ed. 162. Mental Hygiene in the Classroom (2).
- Ed. 163, 164, 165. Community Study Laboratory I, II and III (2, 2, 2,).
- Ed. 170. Introduction to Special Education (2).
- Ed. 171. Education of Retarded and Slow-Learning Children (2).
- Ed. 191. Principles of Adult Education (2). Wiggin.
- Ed. 195. Teaching Traffic Safety and Automobile Operation (2). Offered in Summer School. Laboratory fee, \$3.00.

- Ed. 202. The Junior College (2).
- Ed. 203. Problems in Higher Education (2). Benjamin.
- Ed. 205. Seminar in Comparative Education (2). Benjamin.
- Ed. 207. Seminar in Philosophy of Education (2).
- Ed. 209. Seminar in History of Education (2). Wiggin.
- Ed. 210. The Organization and Administration of Public Education (2). First semester. Newell.
- Ed. 211. The Organization, Administration, and Supervision of Secondary Schools (2). Second semester. Newell.
- Ed. 212. School Finance and Business Administration (2). VanZwoll
- Ed. 213. Administration and Teaching in Junior High School (2).
- Ed. 214. School Buildings and Equipment (2). VanZwoll.
- Ed. 215. Public Education in Maryland (2). Newell.
- Ed. 216. High School Supervision (2). Laboratory fee, \$1.00. Newell.
- Ed. 217. Administration and Supervision in Elementary Schools (2).
- Ed. 218. School Surveys (2-6). Newell.
- Ed. 219. Seminar in School Administration (2). VanZwoll.
- Ed. 220. Pupil Transportation (2).
- Ed. 221. Functional School Plant Planning (2). VanZwoll.
- Ed. 222. Seminar in Supervision (2). Newell.
- Ed. 223. Practicum in Personnel Relationships (2-6). Newell.
- Ed. 224. Internship in School Administration (12-16). Newell.
- Ed. 225. School Public Relations (2). VanZwoll.
- Ed. 226. Child Accounting (2). VanZwoll.

- Ed. 227. Public School Personnel Administration (2). VanZwoll.
- Ed. 228. The Beginning School Principal (2). Newell.
- Ed. 229. Seminar in Elementary Education (2). Schindler.
- Ed. 232. Student Activities in the High School (2).
- Ed. 236. Curriculum Development in the Secondary School (2).
- Ed. 239. Seminar in Secondary Education (2).
- Ed. 242. Coordination in Work-Experience Programs (2). Brown.
- Ed. 243. Application of Theory and Research to Arithmetic in Elementary Schools (2). Schindler.
- Ed. 244. Application of Theory and Research to the Language Arts in Elementary Schools (2). Schindler.
- Ed. 245. Applications of Theory and Research to High School Teaching (2).

  Brechbill.
- Ed. 247. Seminar in Science Education (2).
- Ed. 248. Seminar in Vocational Education (2). Hornbake.
- Ed. 250. Analysis of the Individual (2). Second semester.
- Ed. 261. Counseling Techniques (2).
- Ed. 262. Occupational Information (2). Second semester.
- Ed. 263, 264. Aptitudes and Aptitude Testing (2, 2). Offered in Baltimore.
- Ed. 267. Curriculum Construction Through Community Analysis (2).

  Schindler.
- Ed. 268. Seminar in Educational Sociology (2). Schindler.
- Ed. 269. Seminar in Guidance (2).
- Ed. 278. Seminar in Special Education (2).
- Ed. 279. Seminar in Adult Education (2). Wiggin.
- Ed. 280. Research Methods and Materials in Education (2).
- Ed. 281. Source Materials in Education (2).
- Ed. 288. Research Problems in Education (1-6). First and second semesters.
- Ed. 289. Research—Thesis (1-6). First and second semesters.
- Ed. 291. Administrative Direction of Special Curricular Fields (2).
- Ed. 292. Advanced Creative Art Expression in Elementary Schools (2). Prerequisite, Ed. 124 or 125. Summer School.

# B. Business Education

## FOR GRADUATES AND ADVANCED UNDERGRADUATES

- B. Ed. 101. Methods and Materials in Teaching Office Skills (2).
- B. Ed. 102. Methods and Materials in Teaching Bookkeeping and Related Subjects (2).
- B. Ed. 103. Basic Business Subjects in the Junior High School (2).
- B. Ed. 104. Basic Business Education in the Secondary Schools (2).
- B. Ed. 160. Curriculum Building for Work Experience Programs (2).
- B. Ed. 162. Methods of Teaching in the Part-time Cooperative (Distributive Education) Program (2).
- B. Ed. 165. Organization and Operation of the Part-time Cooperative (Distributive Education) Program (2).
- B. Ed. 180. Merchandise Information for the Distributive Education Coordinator (2).

#### FOR GRADUATES

- B. Ed. 200. Administration and Supervision of Business Education (2).
- B. Ed. 255. Principles and Problems of Business Education (2). Patrick.

## C. Home Economics Education

#### FOR GRADUATES AND ADVANCED UNDERGRADUATES

- H. E. Ed. 102. Problems in Teaching Home Economics (3). First semester.
- H. E. Ed. 120. Evaluation of Home Economics (2).
- H. E. Ed. 140 Curriculum, Instruction, and Observation (3) Second semester.

#### FOR GRADUATES

- H. E. Ed. 200. Seminar in Home Economics Education (2).
- H. E. Ed. 202. Trends in the Teaching and Supervision of Home Economics (2-4)

## D. Human Development Education

- H. D. Ed. 100, 101. Principles of Human Development I and II (3, 3).

  Prescott and Staff.
- H. E. Ed. 102, 103, 104. Child Development Laboratory I, II, and III (2, 2, 2). Prescott and Staff.
- H. D. 112, 114, 116. Scientific Concepts in Human Development I, II, III (3, 3, 3).

H. D. Ed. 113, 115, 117. Laboratory in Behavior Analysis I, II, III (3, 3, 3).

#### FOR GRADUATES

- H. D. Ed. 204. Introduction to Human Development and Child Study (3).
- H. D. Ed. 205. Physical Processes in Human Development (3).
- H. D. Ed. 206, 207. Socialization Processes in Human Development I, II (3, 3).
- H. D. Ed. 208, 209. Self Processes in Human Development I, II (3, 3).
- H. D. Ed. 212, 214, 216. Advanced Scientific Concepts in Human Development I, II, III (3, 3, 3).
- H. D. Ed. 213, 215, 217. Advanced Laboratory in Behavior Analysis I, II, III (3, 3, 3).
- H. D. Ed. 230, 231. Field Program in Child Study I and II (2-6).
- H. D. Ed. 250a, 250b, 250c. Direct Study of Children (1, 1, 1).
- H. D. Ed. 260. Synthesis of Human Development Concepts (3).
- H. D. Ed. 270. Seminars in Special Topics in Human Development (2-6).

## E. Industrial Education

- Ind. Ed. 105. General Shop (2). Second semester Laboratory fee, \$5.00.
- Ind. Ed. 140. Curriculum, Instruction, and Observation (3). First semester.

  Hornbake.
- Ind. Ed. 141, 142. Industrial Safety Education I (2, 2).
- Ind. Ed. 143, 144. Industrial Safety Education II-Advanced (2, 2).
- Ind. Ed. 145, 146. Industrial Hygiene Education (2, 2).
- Ind. Ed. 150. Training Aids Development (2). Second semester. Wall.
- Ind. Ed. 157. Tests and Measurements (2).
- Ind. Ed. 161. Principles of Vocational Guidance (2).
- Ind. Ed. 164. Shop Organization and Management (2). Second semester.
  Wall.
- Ind. Ed. 165. Modern Industry (3). Summer Session.
- Ind. Ed. 166. Educational Foundations of Industrial Arts (2). First semester.
  Brown and Hornbake.
- Ind. Ed. 167. Problems in Occupational Education (2). Offered in Baltimore.
- Ind. Ed. 168. Trade or Occupational Analysis (2). First semester.
- Ind. Ed. 169. Course Construction (2).

- Ind. Ed. 170. Principles of Vocational Education (2). Summer session.
- Ind. Ed. 171. History of Vocational Education (2). Summer session.

- Ind. Ed. 207. Philosophy of Industrial Arts Education (2). First semester. Hornbake.
- Ind. Ed. 214. School Shop Planning and Equipment Selection (2). Second semester. Hornbake.
- Ind. Ed. 216. Supervision of Industrial Arts (2). Second semester.

  Hornbake.
- Ind. Ed. 220. Organization, Administration, and Supervision of Vocational Education (2).
- Ind. Ed. 240. Research in Industrial Arts and Vocational Education (2).

  First and second semesters. Staff.
- Ind. Ed. 241. Content and Method of Industrial Arts (2). Second semester.

  Hornbake.
- Ind. Ed. 248. Seminar in Industrial Arts and Vocational Education (2).

## F. Nursery School-Kindergarten Education

- C. Ed. 100. Child Development I—Infancy (3). First semester. McNaughton.
- C. Ed. 101. Child Development II—Early Childhood (3). Second semester. McNaughton.
- C. Ed. 102. Child Development III—The Child from 5 to 10 (2). First and second semesters.
- C. Ed. 110. Child Development IV (3). First and second semesters. Laboratory fee, \$1.00.
- C. Ed. 112. Play and Play Materials (2). Flannery.
- C. Ed. 113. Education of the Young Child I (2). McNaughton.
- C. Ed. 114. Education of the Young Child II—The Social and and Emotional Needs of the Young Child (2).

  McNaughton.
- C. Ed. 115. Children's Activities and Activities Materials (3). Second semester.
- C. Ed. 116, 117. Creative Expressions; Art, Music, Dance (2-3, 2-3).
- C. Ed. 119. Curriculum, Instruction, and Observation—Cooperative Nursery School (2-3).

- C. Ed. 140. Curriculum, Instruction, and Observation—Nursery School (3). First and second semesters.
- C. Ed. 145. Guidance in Behavior Problems (2). First semester.
- C. Ed. 150. Curriculum, Instruction, and Observation—Kindergarten (2-3). Second semester.
- C. Ed. 160. Speech Problems in Child Development (2).
- C. Ed. 161. Behavior Problems of Childhood and Adolescence (2).
- C. Ed. 165. Leadership Training (2).

# G. Nursing Education

FOR GRADUATES AND ADVANCED UNDERGRADUATES

- N. Ed. 112. School of Nursing Finance and Administration (3). Offered in Baltimore.
- N. Ed. 115, 116. Ward Management and Clinical Teaching (2, 2). Offered in Baltimore.
- N. Ed. 117. Newer Trends in Nursing Service (2). Offered in Baltimore.
- N. Ed. 190. Principles of Pediatric Nursing (3). Offered in Baltimore.

# ENGINEERING

# 4. Aeronautical Engineering

Professor Sherwood; Associate Professor Corning; Assistant Professor Rivello

# FOR GRADUATES AND ADVANCED UNDERGRADUATES

Aero. E. 101, 102. Aerodynamics (3, 2). First and second semesters. Three lectures a week first semester; two lectures a week second semester.

Basic fluid mechanics and aerodynamic theory. Elements of compressible flow.

Sherwood.

Aero. E. 103. Airplane Detail Drafting (1). First semester. One laboratory period a week. Prerequisite, Dr. 3.

Standards of airplane drafting.

Corning.

Aero. E. 104. Airplane Layout Drafting (1). Second semester. One laboratory period a week. Lofting. Prerequisite, Aero. E. 103.

Layout of component parts of airplanes, wings, fuselage, etc. Corning.

Aero. E. 105, 106. Airplane Fabrication Shop (1, 2). First and second semesters. One laboratory period a week first semester; one laboratory period and one lecture a week second semester. Prerequisite, Shop 2.

Aircraft sheet metal forming and fabrication; riveting, and welding.

Rivello.

Aero. E. 107, 108. Airplane Design (4, 4). First and second semesters. Two lectures and two laboratory periods a week. Prerequisites, Mech. 52; Aero. E. 102 and 104.

Theory and practice of airplane design.

Corning.

Aero. E. 109, 110. Aircraft Power Plants (4, 4). First and second semesters. Three lectures and one laboratory period a week. Prerequisites, Mech. 52, M. E. 100.

Thermodynamics and dynamics of aircraft power plant design. Gas turbines and jet propulsion. Study and tests of aircraft engines in laboratory.

Aero. E. 111, 112. Aeronautical Laboratory (2, 2). First and second semesters. One lecture and one laboratory period a week.

Wind tunnel tests. Structure tests. Performance tests of engines and propellers. Staff.

Aero. E. 113, 114. Mechanics of Aircraft Structures (3, 3). First and second semesters. Prerequisite, Mech. 52 and Math. 64.

Principles and problems of airplane stress analysis and design. Rivello.

#### FOR GRADUATES

Aero. E. 200, 201. Advanced Aerodynamics (3, 3). First and second semesters. Two lectures and one laboratory period a week. Prerequisites, Aero. E, 101, 102, Math. 64.

Special problems in performance and stability of aircraft. Design of aircraft for speeds approaching the velocity of sound. Wind tunnel research.

Aero. E. 202, 203. Advanced Aircraft Structures (3, 3). First and second semesters. Two lectures and one laboratory period a week. Prerequisites, Aero. E. 113, 114.

Study of latest scientific reports on aircraft structures. Special problems on wing design for high speeds, high wing loading, thin wing sections, and high aspect ratio. Flexural and torsional stiffness of complete wings. Tests on structures in laboratory.

Aero. E. 204, 205. Aircraft Dynamics (3, 3). First and second semesters. Two lectures and one laboratory period a week. Prerequisites, Mech. 52, Math. 64.

Study of vibrations, wing flutter, gust loads, and dynamics of landing. Calculations of natural frequencies of vibration of aircraft structures.

Aero. E. 206, 207. Advanced Aircraft Power Plants (3, 3). First and second semesters. Two lectures and one laboratory period a week. Prerequisites, M. E. 100; Aero. E. 109, 110.

Special problems of thermodynamics and dynamics of aircraft power plants; jet and rocket engines. Research in power plant laboratory.

Aero. E. 208, 209. Advanced Aircraft Design and Construction (3, 3). First and second semesters. One lecture and two laboratory periods a week. Prerequisites, Aero. E. 107, 108; Math. 64.

A course in project engineering. The student studies methods involved in the design, production, and flight testing of aircraft. Problems in design, production, management, testing, etc.

Aero. E. 210. Aerodynamic Theory (3). First semester. Prerequisites, Aero. E. 101, Math. 64.

A study of the application of hydrodynamic theory to engineering problems. Circulation theory of lift. Induced effects. Velocity potential and stream function. Source and sink flow. Conformal transformation.

Sherwood.

Aero. E. 211. The Design and Use of Wind Tunnels (Supersonic) (3). First and second semesters.

The design and use of wind tunnels (supersonic). Review of basic aerodynamics and thermodynamics. Problems in supersonic tunnel design such as pumping, power supply, condensation and driers. Equipment for measuring results such as balances, manometers, optical instruments, such as schlieren, spark illumination and X-ray equipment.

Investigations in supersonic wind tunnels are described with special reference to similitude required for conversion to full scale.

Aero. E. 212, 213. Bodies at Supersonic Speeds (3, 3). First and second semesters. Prerequisites, Degree in Aero. E. or M. E. or equivalent, and consent of instructor.

Brief review of gasdynamics, drag, lift stability, and damping on a body in a supersonic stream. Special aerodynamic problems in the design of supersonic missiles. Methods for obtaining accurate test data on the aerodynamic characteristics of supersonic missiles. Kurzweg at N. O. L.

## B. Chemical Engineering

#### FOR GRADUATES AND ADVANCED UNDERGRADUATES

Ch. E. 103 f,s. Elements of Chemical Engineering (3, 3). Three hours a week, both semesters. Prerequisites, Chem. 1, 3; Phys. 20, 21.

Huff, Smatko.

- \*Ch. E. 104. Chemical Engineering Seminar (1). One hour a week, both semesters. Prerequisite, permission of department. Huff.
- Ch. E. 105 f,s. Advanced Unit Operations (5, 5). Two lectures and one all-day laboratory a week, both semesters. Prerequisites, Ch. E. 103 f,s;
  Chem. 187, 188, 189, 190. Laboratory fee, \$8.00 per semester. Bonney.

<sup>\*</sup> The contents of this course are constantly changing so a student may receive a number of credits by re-registering.

- Ch. E. 106 f,s. Minor Problems (6, 6). Six hours a week, both semesters. Prerequisites, Ch. E. 105 or simultaneous registration therein. Laboratory fee, \$8.00. (Not offered in 1950-1951.)
  - Huff, Bonney, Smatko, Klier.
- Ch. E. 107. Fuels and Their Utilization (3). Three hours a week, second semester. Prerequisite, Ch. E. 103 f,s, or permission of the department. Huff.
- Ch. E. 108 f.s. Industrial Chemical Technology (2, 2). Two hours a week, both semesters. Prerequisite, Ch. E. 3, or simultaneous registration therein or permission of the department.
- Ch. E. 109 f,s. Chemical Engineering Thermodynamics (3, 3). Two hours a week, both semesters. Prerequisites, Ch. E. 103, f,s; Chem. 187, 188, 189, 190, or permission of the department.
- Ch. E. 110. Advanced Chemical Engineering Calculations (3). Three hours a week, first semester. Prerequisites, Math. 20, 21; Ch. E. 103 f.s. Bilbrey.
- Ch. E. 114. Applications of Electrochemistry (4). First semester. Three lecture hours and three laboratory hours a week. Prerequisite, consent of instructor. Laboratory fee, \$8.00.
- Ch. E. 182, 183. Optical and X-Ray Metallography (4, 4). First and second semesters. Prerequisites, Ch. E. 64, 66; Ch. E. 65, 67; Ch. E. 68, 70, or permission of instructor. Laboratory fee, \$4.00 per semester. Klier.
- Ch. E. 184, 185. Mechanical Metallurgy (3, 3). First and second semesters. Three lectures per week. Prerequisites, Math. 114, 115; Ch. E. 182, 183. Klier.
- Ch. E. 187. Gases in Metals (2). Second semester. Prerequisites, Ch. E. 182, 183, or permission of the instructor. Klier.

- Ch. E. 201 f,s. Graduate Unit Operations and Processes (5, 5 or more).
   One hour conference, three or more three-hour laboratory periods a week, both semesters. Prerequisite, permission of the department.
   Laboratory fee, \$8.00 per semester.
- Ch. E. 202, f.s. Gas Analysis. (3). One lecture and two three-hour laboratory periods a week, one semester, to be arranged. Prerequisite, permission of the department. Laboratory fee, \$8.00 per semester. Bonney.
- Ch. E. 203. Graduate Seminar (1). One hour a week, each semester. The content of this work is constantly changing, so a student may receive a number of credits by re-registering. Prerequisite, permission of the department.
  Huff.
- Ch. E. 205. Research and Chemical Engineering and Metallurgy. Prerequisites and credits to be arranged for individuals. Laboratory fee, \$8.00 per semester. Huff, Bonney, Smatko, Klier.

- Ch. E. 207 f,s. Plant Design Studies (3, 3). Three hours a week, both semesters. Prerequisite, permission of the department. Huff.
- Ch. E. 209 f,s. Plant Design Studies Laboratory (3, 3). Three laboratory periods a week, both semesters. Prerequisite, permission of the department. Laboratory fee, \$8.00 per semester.
- Ch. E. 210 f,s. Gaseous Fuels (2, 2). Two hours a week, both semesters.

  Prerequisite, permission of the department.

  Huff.
- Ch. E. 214. Corrosion and Metal Protection (4). Second semester. Four lecture hours a week. Prerequisites, Ch. E. 114 or Chem. 187, 189 or Chem. 188, 190, or consent of the instructor.
- Ch. E. 220, 221. Solid Phase Reactions (3, 3). First and second semesters. Prerequisites, Chem. 187; Chem. 188, 190; Ch. E. 182, 183; or permission of the instructor. Klier.
- Ch. E. 224, 225. Advanced X-Ray Metallography (3, 3). First and second semesters. Prerequisites, Math. 114, 115; Ch. E. 182, 183. Laboratory fee, \$4.00 per semester. Klier.
- Ch. E. 228. Seminar in Metallurgy (1). First and second semesters. Required of graduate students in metallurgical curriculum. The content of this course is constantly changing so a student may earn a number of credits by re-registration.

# C. Civil Engineering

# FOR GRADUATES AND ADVANCED UNDERGRADUATES

C. E. 100. Theory of Structures (4). Second semester. Three lectures and one laboratory period a week. Prerequisite, Mech. 50.

Analytic and graphical determination of dead and live load stresses in beams and framed structures; influence lines; lateral bracing and portals; elements of slope and deflection.

Allen, Piper.

C. E. 101. Soil Mechanics (3). First semester. Two lectures and one laboratory period a week. Prerequisite, Mech. 50 and 53.

An introductory study of the properties and behavior of soils as engineering materials. Soil physics, soil mechanics, and applications to engineering.

Barber.

C. E. 102. Structural Design (6). First semester. Five lectures and one laboratory a week. Prerequisite, C. E. 100.

Design and detailing of wood and metal structural members and their connections; wind stresses in building frames; structural frameworks. Allen.

C. E. 103. Concrete Design (6). Second semester. Five lectures and one laboratory period a week. Prerequisite, C. E. 100.

Design and detailing of plain and reinforced concrete structures, applications of slope-deflection and moment distribution theories; rigid frames.

Allen.

C. E. 104. Water Supply (3). First semester. Two lectures and one laboratory period a week. Prerequisite, C. E. 50.

Requirements of a municipal water supply—design, operation, maintenance, and administration. Otts.

C. E. 105. Sewerage (3). Second semester. Two lectures and one laboratory period a week. Prerequisite, C. E. 50.

The collection, treatment and disposal of sewage.

Otts.

C. E. 106 Elements of Highways (3). Second semester. Two lectures and one laboratory period a week. Prerequisite, C. E. 101.

Location, design, construction, and maintenance of roads and pavements.

Laboratory problems and field inspection trips.

Barber, Gohr.

C. E. 107. Statically Indeterminate Structures (3, 3). First and second semesters. Prerequisite, Mech. 50 or equivalent.

Deflections in beams, trusses and similar structures, both statically determinate and indeterminate. Real and virtual work, Catigliano's Theorem, area moments, the Williott-Mohr diagram. Classical methods of analysis of indeterminate structures; theorem of three moments, method of least work, slope deflection method. Modern methods of analysis of indeterminate structures; moment distribution, general method of successive corrections. Applications to particular structures; arches, closed rings, built-in beams and beams over multiple supports.

Allen, Keller.

#### FOR GRADUATES

C. E. 200. Advanced Properties of Materials (3). First or second semester. Prerequisite, Mech. 53 or equivalent.

A critical study of elastic and plastic properties, flow of materials, resistance to failure by fracture, impact and corrosion, the theories of failure.

Assigned reading from current literature.

Wedding.

C. E. 201. Advanced Strength of Materials (3). First or second semester. Prerequisite, Mech. 50, 51 or equivalent.

Special problems in engineering stress analysis. Limitations of flexure and torsion formulas, unsymmetrical bending, curved beams, combined stresses, thin tubes, thick-walled cylinders and flat plates. Keller.

C. E. 202. Applied Elasticity (3). First or second semester. Prerequisite, Math. 64 or equivalent.

Two-dimensional elastic problems, general stress-strain analysis in three dimensions, stability of beams, columns, and thin plates.

C. E. 203. Soil Mechanics (3). First or second semester. Prerequisite, C. E. 101 or equivalent.

A detailed study of the properties of engineering soils. Assigned reading from current literature. Barber.

C. E. 204. Advanced Foundations (3). First or second semester. Prerequisites, C. E. 101, 102 and 103 or equivalent.

A detailed study of types of foundations. Design and construction to meet varying soil conditions. Barber.

C. E. 205. Highway Engineering (3). First or second semester. Prerequisite, C. E. 106 or equivalent.

An intensive course in the location, design, and construction of highways.

Barber, Gohr.

C. E. 206. Theory of Concrete Mixtures (3, 3). First and second semesters. Prerequisite, Mech. 53 or equivalent.

A thorough review of the methods for the design of concrete mixtures, followed by a study of factors affecting the properties of the resulting concrete. This course is intended as a background for work in the field of concrete, concrete aggregates, or reinforced concrete. The second semester of this course is open only to students who are majoring in concrete.

Walker.

C. E. 207. Advanced Structures (4). First and second semesters. Three lectures and one laboratory period a week. Prerequisites, C. E. 102, 103.

The solution of statically indeterminate structures by classical and modern methods, with emphasis on the latter.

Allen.

C. E. 208. Advanced Sanitation (3). First or second semester. Prerequisite, graduate standing in civil engineering.

A detailed study of environment and its relation to disease, covering malaria and its control; rodent control; food sanitation; collection and disposal of municipal refuse; housing sanitation, including plumbing, ratproofing, etc.; rural water supply and excreta disposal; sanitary inspection procedure.

Otts.

C. E. 209. Advanced Water Supply (3). First or second semester. Prerequisite, C. E. 104 or equivalent.

A detailed study of the problems of water supply, including recent developments in the treatment of water.

Otts.

C. E. 210. Advanced Sewerage (3). First or second semester. Prerequisite, C. E. 105 or equivalent.

A detailed study of the problems of sewerage, including recent developments in the treatment of sewage. Otts.

C. E. 211. Sanitary Engineering Design (3). First or second semester. Prerequisite, C. E. 104, 105 or equivalent.

Practical problems in the design of sewer systems and appurtenances; sewage treatment plants; water collection and distribution systems; water purification plants.

Otts.

C. E. 212. Research. Credit in accordance with work done. First and second semesters.

- C. E. 213. Seminar. First or second semester. Credit in accordance with work outlined by the civil engineering staff. Prerequisite, graduate standing in civil engineering. Staff.
- C. E. 214. Sanitary Engineering Laboratory (3). First or second semester. Prerequisite, C. E. 104 and C. E. 105 or equivalent.

Lectures, conferences, assigned readings, and laboratory exercises in the technique and principles involved in the physical, bacteriological and chemical tests used in water analysis.

Otts.

C. E. 215. Sanitary Engineering Laboratory (3). First or second semester. Prerequisite, C. E. 104 and C. E. 105 or equivalent.

Lectures, conferences, assigned readings, and laboratory exercises in the technique and principles involved in the physical, bacteriological and chemical tests used in sewage and industrial waste analysis.

Otts.

C. E. 216. Hydraulic Engineering (3). First or second semester. Prerequisite, C. E. 50 or equivalent.

Water power and flood control. Analysis of the principal features of a water power project with special reference to reservoir, waterway, dam, plant accesories, and powerhouse equipment. Complete report on a water power project required, including costs and power valuation. Cournyn.

C. E. 217. Hydraulic Machinery (3). First or second semester. Prerequisite, C. E. 50 or equivalent.

Principles of design, selection and operation of hydraulic pumps, turbines and other hydraulic machinery.

Cournyn.

## D. Electrical Engineering

- E. E. 100. Alternating-Current Circuits (4). Three lectures and one laboratory period a week, first semester. Laboratory fee, \$4.00. Prerequisites, Math. 21, Phys. 21 and E. E. 1.
- E. E. 101. Engineering Electronics (4). Three lectures and one laboratory period a week, second semester. Laboratory fee, \$4.00. Prerequisite, E. E. 100.
- E. E. 102, 103. Alternating-Current Machinery (4, 4). Three lectures and one laboratory period a week, first and second semesters. Laboratory fee \$4.00. Prerequisites, E. E. 65 and E. E. 100.
- E. E. 104. Communication Circuits (3). Three lectures a week, second semester. Prerequisites, E. E. 60 and E. E. 100.
- E E. 105, 106 Radio Engineering (4, 4). Three lectures and one laboratory period a week, first and second semesters. Laboratory fee, \$4.00. Prerequisite, E. E. 101.
- E. E. 108. Electric Transients (3). Three lectures a week, second semester. Prerequisite, E. E. 101.

- E. E. 109. Principles of Radar (3). Three lectures a week, second semester. Prerequisite, E. E. 105.
- E. E. 114. Applied Electronics (3). Three lectures a week, first semester. Prerequisite, E. E. 101.
- E. E. 116. Alternating-Current Machinery Design (3). Two lectures and one calculation period a week, second semester. Prerequisite, concurrent registration in E. E. 103.
- E. E. 117. Power Transmission and Distribution (3). Three lectures a week, first semester. Prerequisite, concurrent registration in E. E. 102.
- E. E. 120. Electromagnetic Waves (3). Three lectures a week, first semester. Prerequisites, senior standing in electrical engineering or physics and B average in mathematics. Required of M. S. degree candidates in electrical engineering.
- E. E. 160, 161. Vacuum Tubes (3, 3). Three lectures a week, first and second semesters. Prerequisites, senior standing in electrical engineering or physics and B average in mathematics.

- E. E. 200. Symmetrical Components (3). Three lectures a week, first semester. Prerequisite, E. E. 103.
- E. E. 201. Electromagnetic Theory (3). Three lectures a week, second semester. Prerequisite, E. E. 120. Required of M. S. degree candidates in electrical engineering.
- E. E. 202, 203. Transients in Linear Systems (3, 3). Three lectures a week, first and second semesters. Prerequisite, undergraduate major in electrical or mechanical engineering or physics. Required of M. S. degree candidates in electrical engineering.
- E. E. 204, 205. Advanced Circuit Analysis (3, 3). Three lectures a week, first and second semesters. Prerequisite, undergraduate major in electrical engineering or physics.
- E. E. 206. 207. Ultra-High-Frequency Techniques (3, 3). Three lectures a week, first semester; two lectures and one laboratory period a week, second semester. Laboratory fee, \$4.00. Prerequisite, E. E. 201.
- E. E. 209. Stability in Power Systems (3). Three lectures a week, second semester. Prerequisite, E. E. 200.
- E. E. 210, 211. Advanced Radio Engineering (3, 3). Three lectures a week, first and second semesters. Prerequisite, E. E. 106. (Not offered in 1950-1951.)
- E. E. 212, 213. Automatic Regulation (3, 3). Three lectures a week, first and second semesters. Prerequisite, undergraduate major in electrical or mechanical engineering or physics. (Not offered in 1950-1951.)

- E. E. 215, 216. Radio Wave Propagation (3, 3). Three lectures a week, first and second semesters. Prerequisite, E. E. 120. (Not offered in 1950-1951.)
- E. E. 222 Graduate Seminar (1). First semester. Prerequisite, approved application for candidacy to the degree of Master of Science or Doctor of Philosophy in electrical engineering.
- E. E. 232. Active Network Analysis (3). Three lectures a week, first semester. Prerequisite, E. E. 202 or E. E. 204.
- E E. 233. Network Synthesis (3). Three lectures a week, second semester Prerequisite, E. E. 232.
- E. E. 235. Applications of Tensor Analysis (3). Three lectures a week, second semester. Prerequisite, E. E. 202.
- E. E. 250 Electrical Engineering Research. Prerequisite, approved application for candidacy to the degree of Master of Science or Doctor of Philosophy in electrical engineering. Six semester hours are required of M.S. degree candidates and a minimum of 12 semester hours are required of Ph.D. candidates.

# E. Mechanical Engineering

- M. E. 100. Thermodynamics (3). First semester. Two lectures and one laboratory period a week. Prerequisites, Phys. 21, Math. 21 Required of juniors in Mechanical and Aeronautical Engineering.
- M. E. 101. Heat Transfer (2). First semester. Two lectures a week. Prerequisites, M. E. 54 and M. E. 100. Required of seniors in Mechanical Engineering.
- M. E. 102. Heating and Air Conditioning (3). First semester. Two lectures and one laboratory period a week. Prerequisites, M. E. 100, M. E. 54; M. E. 101 concurrently.
- M. E. 103. Refrigeration (3). Second semester. Two lectures and one laboratory period a week. Prerequisites, M. E. 100, M. E. 101, M. E. 102. Required of seniors in Mechanical Engineering.
- M. E. 104, 105. Prime Movers (4, 4). First and second semesters. Three lectures and one laboratory period a week. Prerequisites, Mech. 52, M. E. 54, M. E. 100. Required of seniors in Mechanical Engineering.
- M. E. 106, 107. Mechanical Engineering Design (4, 4). First and second semesters. Two lectures and two laboratory periods a week. Prerequisites, Mech. 52, M. E. 53.
- M. E. 108, 109. Mechanical Laboratory (2, 2). First and second semesters. One lecture and one laboratory period a week. Prerequisite, senior standing. Required of seniors in Mechanical Engineering.

- M. E. 200, 201. Advanced Dynamics (3, 3). First and second semesters. Prerequisites, Mech. 52, Math. 64, M. E. 107; M. E. 109.
- M. E. 202, 203. Applied Elasticity (3, 3). First and second semesters. Prerequisites, Mech. 52, Math. 64, M. E. 107.
- M. E. 204, 205. Advanced Thermodynamics and Heat Transfer. (3, 3).
   First and second semesters. Three lectures a week. Prerequisites,
   M. E. 101, M. E. 104, M. E. 105, Math. 64.
- M. E. 206, 207. Advanced Machine Design (3, 3). First and second semesters. Two lectures and one laboratory period a week. Prerequisite, Math. 64, M. E. 107.
- M. E. 208, 209. Steam Power Plant Design (3, 3). First and second semesters. One lecture and two laboratory periods a week. Prerequisite, M. E. 105.
- M. E. 210, 211. Advanced Fluid Mechanics (3, 3). First and second semesters. Prerequisites, M. E. 54, Math. 64.
- M. E. 212, 213. Advanced Steam Power Laboratory (2, 2). First and second semesters. One lecture and one laboratory period a week. Prerequisite, registration in M. E. 204, 205.
- M. E. 214, 215. Advanced Applied Mechanics Laboratory (2, 2). First and second semesters. One lecture and one laboratory period a week. Prerequisites, registration in M. E. 200, 201 and M. E. 202, 203.
- M. E. 216, 217. Advanced Internal Combustion Engine Design (3, 3). First and second semesters. One lecture and two laboratory periods a week. Prerequisites, M. E. 104, 105; M. E. 106, 107 and registration in M. E. 200, 201 and M. E. 204, 205.
- M. E. 218, 219. Advanced Internal Combustion Engine Laboratory (2, 2). First and second semesters. One lecture and one laboratory period a week. Prerequisite, registration in M. E. 216, 217.
- M. E. 220. Seminar. Credit in accordance with work outlined by mechanical engineering staff. Prerequisite, graduate standing in mechanical engineering.
- M. E. 221. Research. Credit in accordance with work outlined by mechanical engineering staff. Prerequisite, graduate standing in mechanical engineering.

Research in any field of mechanical engineering as applied mechanics, heat transfer, thermodynamics, heat, power, etc.

M. E. 222. Advanced Metallography (3). First semester. Two lectures and one laboratory period a week. Prerequisite, M. E. 53, Mech. 52.

- M. E. 223, 224. Steam and Gas Turbine Design (3, 3). First and second semesters. Three lectures a week. Prerequisites, M. E. 101, M. E. 104, M. E. 105, Math. 64.
- M. E. 225, 226. Advanced Properties of Metals and Alloys. (2, 2). First and second semesters. Two lectures a week. Prerequisite, Mech. 52, M. E. 53, M. E. 106, M. E. 107,
- M. E. 227, 228. Theory of Elasticity (3, 3). First and second semesters. Three lectures a week. Prerequisites, Mech. 52, M. E. 53, M. E. 106, M. E. 107, Math. 64.
- M. E. 229, 230. Jet Propulsion (3, 3). Prerequisites, M. E. 101, M. E. 104, M. E. 105.

## ENGLISH LANGUAGE AND LITERATURE

# Special Departmental Requirements

#### MASTER OF ARTS

- 1. Candidates for the degree of Master of Arts in the Department of English must demonstrate a reading knowledge of a foreign language at the time of admission, or not later than three months before taking the degree. Choice of French or German is recommended.
- 2. A final written examination will be based in part upon the courses pursued and in part upon general familiarity with English and American literature. The examination will test the candidate's powers of analysis and criticism.

# DOCTOR OF PHILOSOPHY

- 1. Candidates for the degree of Doctor of Philosophy in the Department of English must demonstrate a reading knowledge of German and one other approved modern foreign language.
- 2. Candidates must pass a comprehensive written examination at least three months before they expect to be awarded degrees. This examination will include linguistics (morphology and phonology) and each of the major literary fields.

#### FOR GRADUATES AND ADVANCED UNDERGRADUATES

Eng. 101. History of the English Language (3). Second semester.

Harman.

Eng. 102. Old English (3). First semester.

Ball. Ball.

Eng. 103. Beowulf (3). Second semester

Eng. 104. Chaucer (3). First semester.

Harman.

Eng. 106. English and Scottish Ballads (3). Not offered in 1950-1951. Cooley.

- Eng. 110, 111. Elizabethan and Jacobean Drama (3, 3). First and second semesters. Zeeveld.
- Eng. 112. Poetry of the Renaissance (3). Not offered in 1950-1951.

  Zeeveld.
- Eng. 113. Prose of the Renaissance (3). Not offered in 1950-1951. Zeeveld.
- Eng. 115, 116. Shakespeare (3, 3). First and second semesters. Zeeveld.
- Eng. 120. English Drama from 1660 to 1800 (3). Second semester.

Weber.
Murphy.

Murphy.

- Eng. 121. Milton (3). Second semester.
- Eng. 122. Literature of the Seventeenth Century, 1600-1660 (3). First semester. Murphy.
- Eng. 123. Literature of the Seventeenth Century, 1660-1700 (3). Second semester. Aldridge.
- Eng. 125, 126. Literature of the Eighteenth Century (3, 3). First and second semesters. Aldridge.
- Eng. 129, 130. Literature of the Romantic Period (3, 3). First and second semesters. Weber.
- Eng. 134, 135. Literature of the Victorian Period (3, 3). First and second semesters. Cooley, Mooney.
- Eng. 139, 140. The English Novel (3, 3). First and second semesters.

  Aldridge, Mooney.
- Eng. 143. Modern Poetry (3). First semester.
- Eng. 144. Modern Drama (3). First semester. Weber.
- Eng. 145. The Modern Novel (3). Second semester.
- Eng. 148. The Literature of American Democracy (3). First semester.

  Manning.
- Eng. 150, 151. American Literature to 1900 (3, 3). First and second semesters. Gravely, Manning.
- Eng. 155, 156. Four Major American Writers (3, 3). First and second semesters.

  Manning, Gravely.
- Eng. 157. Introduction to Folklore (3). First semester. Cooley.
- Eng. 170. Creative Writing (2). First semester. Prerequisite, permission of the instructor Fleming.
- Eng. 171. Advanced Creative Writing (2). Second semester. Prerequisite, permission of the instructor. Fleming.
- Eng. 172. Playwriting (2). Second semester. Prerequisite, permission of the instructor. Fleming.

Amer. Civ. 137, 138. Conference Course in American Civilization (3, 3).

First and second semesters.

Bode.

## FOR GRADUATES

- Eng. 200. Research (3-6). Arranged. Staff.
- Eng. 201. Bibliography and Methods (3). First semester. Mooney.
- Eng. 202. Middle English (3). First semester. Harman.
- Eng. 203. Gothic (3). Second semester. Harman.
- Eng. 204. Medieval Romances (3). First semester. Cooley.
- Eng. 206, 207. Seminar in Renaissance Literature (3, 3). First and second semesters. McManaway.
- Eng. 210. Seminar in Seventeenth Century Literature (3). Second semester.

  Murphy.
- Eng. 212, 213. Seminar in Eighteenth Century Literature (3, 3). First and second semesters. Aldridge.
- Eng. 214, 215. Seminar in Nineteenth Century Literature (3, 3). First and second semesters. Cooley, Mooney, Weber.
- Eng. 216, 217. Literary Criticism (3, 3). First and second semesters
- Eng. 225, 226. Seminar in American Literature (3, 3). First and second semesters.
- Eng. 227, 228. Problems in American Literature (3, 3). First and second semesters.
- Eng. 230. Studies in American Language (3). (Not offered in 1950-1951.)

# ENTOMOLOGY

- Ent. 100. Advanced Apiculture (3). Second semester. One lecture and two three-hour laboratory periods a week. Prerequisite, Ent. 4. Laboratory fee, \$3.00.

  Abrams.
- Ent. 101. Economic Entomology (3). First semester. Prerequisite, consent of the department. Cory.
- Ent. 103, 104. Insect Pests (3, 3). Laboratory fee, \$3.00. (Not offered in 1950-1951.)
- Ent. 105. Medical Entomology (3). Two lectures and one two-hour laboratory period a week, fiirst semester. Prerequisite, Ent. 1 or consent of the department. Laboratory fee, \$3.00.
- Ent. 106. Advanced Insect Taxonomy (3). First semester. Two three-hour laboratory periods a week. Prerequisite, Ent. 3. Laboratory fee, \$3.00.

- Ent. 107. Insecticides (2). Second semester. Prerequisites, Ent. 1 and elementary Organic Chemistry. Shepard.
- Ent. 109. Insect Physiology (2). Two lectures and occasional demonstrations, second semester. Prerequisite, consent of the department.

Munson.

- Ent. 110, 111. Special Problems (1, 1). First and second semesters. Prerequisites, to be determined by the department. Cory.
- Ent. 112. Seminar (1). First and second semesters. Cory.
- Ent. 113. Entomological Literature (1). Second semester. Prerequisite, senior standing. Bickley.
- Ent. 114. Insect Pests of Greenhouses (3). Second semester. Two lectures and one three-hour laboratory period a week. Prerequisite, Ent. 1 or consent of the department. Laboratory fee, \$3.00. Haviland.

### FOR GRADUATES

- Ent. 201. Advanced Entomology. Credit and prerequisites to be determined by the department. First and second semesters. Cory.
- Ent. 202. Research. Cory.
- Ent. 203. Advanced Insect Morphology (2). Second semester. One lecture and one three-hour laboratory period a week. Laboratory fee, \$3.00.
- Ent. 205. Insect Ecology (2). First semester. One lecture and one two-hour laboratory period a week. Laboratory fee, \$3.00. Prerequisite, consent of the department.
- Ent. 206. Bionomics of Mosquitoes. Second semester. One lecture and one three-hour laboratory period a week. Laboratory fee, \$3.00. Bickley.

#### FOREIGN LANGUAGES AND LITERATURE

#### A. French

- French 100. French Literature of the Sixteenth Century (3). First semester.
- French 101, 102. French Literature of the Seventeenth Century (3, 3). Three hours a week, first and second semesters.
- French 103, 104. French Literature of the Eighteenth Century (3, 3).

  Three hours a week, first and second semesters.

  Falls.
- French 105, 106. French Literature of the Nineteenth Century (3, 3). Three hours a week, first and second semesters.
- French 121, 122. Advanced Composition (3, 3). Three hours a week, first and second semesters. Falls.

- French 161, 162. French Life and Culture (3, 3). Three hours a week, first and second semesters. Rosenfield.
- French 199. Rapid Review of the History of French Literature (1). Second semester. Especially designed for French majors.

Weekly lectures stressing the leading concepts in the history of French literature.

# FOR GRADUATES

The requirements of students will determine which courses will be offered.

- French 201. Research. Credits determined by work accomplished.
- French 203, 204. George Duhamel, Poet, Dramatist, Novelist (2, 2). Two hours a week, first and second semesters. Falls.
- French 205, 206. French Literature of the Middle Ages (2, 2). Two hours a week, first and second semesters.
- French 207, 208. The French Novel in the First Half of the Nineteenth Century (2, 2). Two hours a week, first and second semesters. Falls.
- French 209, 210. The French Novel in the Second Half of the Nineteenth Century (2, 2). Two hours a week, first and second semesters. Falls.
- French 211. Introduction to Old French (3). Second semester.
- French 213, 214. Seminar (2, 2). Two hours a week, first and second semesters. Required of all graduate majors in French.
- French 215, 216. Moliere (2, 2). First and second semesters. Quynn.
- French 221, 222. Reading Course (2, 2). One conference a week, first and second semesters.

# B. German

- German 101, 102. German Literature of the Eighteenth Century (3, 3).

  Three hours a week, first and second semesters. Prahl.
- German 103, 104. German Literature of the Nineteenth Century (3, 3).

  Three hours a week, first and second semesters. Prahl.
- German 105, 106. Contemporary German Literature (3, 3). Three hours a week, first and second semesters. Prahl.
- German 107, 108. Goethe's Faust (2, 2). Two hours a week, first and second semesters. Zucker.
- Attention is called to Comp. Lit. 106, Romanticism in Germany, and Comp. Lit. 107, The Faust Legend in English and German Literature.
- German 121, 122. Advanced Composition (3, 3). Three hours a week, first and second semesters. Prerequisites, German 71, 80, or consent of instructor.

German 161, 162. German Life and Culture (3, 3). Three hours a week, first and second semesters. Cunz.

German 199. Rapid Review of the History of German Literature (1). Second semester. Especially designed for German majors.

Weekly lectures stressing the leading concepts in the history of German literature.

#### FOR GRADUATES

The requirements of students will determine which courses will be offered.

German 201. Research. Credits determined by work accomplished.

German 202, 203. The Modern German Drama (3, 3). Three hours a week, first and second semesters. Zucker.

German 204. Schiller (3).

Prahl.

German 205. Goethe's Works Outside of Faust (2). Second semester.

Zucker.

German 206. The Romantic Movement (3).

Prahl.

German 208. The Philosophy of Goethe's Faust (3). First semester.

Zucker.

German 210. Seminar (3, 3). First and second semesters. Zucker. Required of all graduate students in German.

German 220, 221. Reading Course (2, 2). First and second semesters.

Designed to give the graduate student the background of a survey of German literature. Extensive outside readings with reports and connecting lectures.

German 230. Introduction to European Linguistics (3). First semester.

German 231. Middle High German (3). Second semester.

# C. Spanish

# FOR GRADUATES AND ADVANCED UNDERGRADUATES

Spanish 101. Epic and Ballad (3). First semester.

Spanish 104. The Drama of the Golden Age (3). Second semester.

Spanish 108. Lope de Vega (3). First semester.

Spanish 109. Cervantes (3). Second semester.

Spanish 110. Modern Spanish Poetry (3). First semester.

Spanish 111. Modern Spanish Novel (3). Second semester.

Spanish 112. Modern Spanish Drama (3). First semester.

Spanish 115. Modern Spanish Thought (3). Second semester.

Spanish 121,122. Advanced Composition (3, 3). First and second semester. Translation from English to Spanish, free composition, letter writing.

Spanish 151. Latin-American Novel (3). First semester.

Spanish 152. Latin-American Poetry (3). Second semester.

Spanish 153. Latin-American Essay (3). First semester.

Spanish 161, 162. Spanish Life and Culture (3, 3). First and second semesters. Z. Jiménez.

Introductory study of the literary, educational, artistic traditions, great men, customs and general culture.

Spanish 163, 164. Latin-American Civilization (3, 3). First and second semesters.

Introductory study of the geography, history, government, economics, literature and thought. Offered in conjunction with staff members from the Departments of Geography, History, and Government and Politics.

Spanish 199. Rapid Review of the History of Spanish Literature (1). Second semester. Especially designed for Spanish majors. Parsons.

Weekly lectures stressing the leading concepts in the history of Spanish literature.

## FOR GRADUATES

Spanish 201. Research. Credits determined by work accomplished.

Spanish 202. The Golden Age in Spanish Literature (3). First semester.

Spanish 203, 204. Spanish Poetry (3, 3). Three hours a week, first and second semesters.

Spanish 207. The Spanish Mystics (3).

Spanish 210. Seminar. Arranged.

J. R. Jiménez.

Spanish 213. Introduction to Old Spanish (3). Second semester.

Spanish 221, 222. Reading Course. Arranged.

#### HISTORY

# Special Departmental Requirements

Eight to ten hours of the total major course requirements of all candidates for this degree must be acquired in the general field of thesis, i. e., either American or European history.

#### DOCTOR OF PHILOSOPHY

- 1. At least thirty hours of the total major course requirements must be acquired in the general field of the thesis, i. e., American history or European history.
- 2. At least ten hours of the thirty required for a minor in history must be taken at the University of Maryland.

3. Prospective candidates must pass preliminary written and oral examinations covering various fields of their major and minor subjects before admission to candidacy. Consult the head of the department for details.

# FOR GRADUATES AND ADVANCED UNDERGRADUATES

# A. American History

- H. 5, 6 or H. 3, 4, are prerequisites for courses H. 101 to H. 142, inclusive.
- H. 101. American Colonial History (3). First semester. Ferguson.
- H. 102. The American Revolution (3). Second semester. Ferguson.
- H. 105, 106. Social and Economic History of the United States to 1860
   (3, 3). Three hours a week, first and second semesters. (Not offered in 1949-1950.)
- H. 107. Social and Economic History of the United States, 1860-1900 (3).
  First semester.
  Chatelain.
- H. 108. Social and Economic History of the United States, Since 1900 (3).
  Second semester. Chatelain.
- H. 115. The Old South (3). First semester.
- H. 116. The Civil War and Reconstruction (3). Second semester. Merrill.
- H. 118, 119. Recent American History (3, 3). First and second semesters.
- H. 121, 122. History of the American Frontier (3, 3). Three hours a week, first and second semesters. Gewehr.
- H. 127, 128. Diplomatic History of the United States (3, 3). Three hours a week, first and second semesters. Wellborn.
- H. 129. The United States and World Affairs (3). First semester.

Wellborn.

Sparks.

- H. 130. Territorial Dependencies of the United States (3). Wellborn.
- H. 133, 134. The History of American Ideas (3, 3). Three hours a week, first and second semesters. Johnson.
- H. 135, 136. Constitutional History of the United States (3, 3). Three hours a week, first and second semesters. Gewehr.
- H. 141, 142. History of Maryland (3, 3). Three hours a week, first and second semesters. (Not offered in 1949-1950.) Chatelain.
- H. 145, 146. Latin-American History (3, 3). Three hours a week, first and second semesters.
  Crosman.
- H. 147. History of Mexico (3). First semester. Crosman.

### B. European History

H. 151. History of the Ancient Orient and Greece (3). First semester.

Jashemski.

- H. 153. History of Rome (3). Second semester.
- Jashemski.
- H. 155. Medieval Civilization (3). First semester. Prerequisites, H. 1, 2, or H. 3, 4.
- H. 161. The Renaissance and Reformation (3). Second semester. Prerequisites, H. 1, 2, or H. 3, 4.
  Jashemski.
- H. 166. Revolutionary and Napoleonic Europe (3). Second semester. Prerequisites, H. 1, 2, or H. 3, 4. Bauer.
- H. 171, 172. Europe in the Nineteenth Century, 1815-1919 (3, 3). Three hours a week, first and second semesters. Prerequisites, H. 1, 2, or H. 3, 4.
- H. 175, 176. Europe in the World Setting of the Twentieth Century (3, 3).
  Three hours a week, first and second semesters. Prerequisites, H. 1, 2, or H. 3, 4.
- H. 179, 180. Diplomatic History of Europe Since 1871 (3, 3). Three hours a week, first and second semesters. Prerequisites, H. 1, 2, or H. 3, 4.
   Prange.
- H. 181, 182. History of Central Europe (3, 3). Three hours a week, first and second semesters. Prerequisites, H. 1, 2, or H. 3, 4. Prange.
- H. 185, 186. History of the British Empire (3, 3). Three hours a week, first and second semesters. Prerequisites, H. 1, 2, or H. 3, 4, or equivalent. Gordon.
- H. 187. History of Canada (3). First semester. Prerequisites, H. 1, 2, or H. 3, 4.
- H. 189. Constitutional History of Great Britain (3). A survey of constitutional development in England with emphasis on the real property aspects of feudalism, the growth of the common law, the development of Parliament and the expansion of the liberties of the individual.
  Gordon.
- H. 191. History of Russia (3). First semester. Prerequisites, H, 1, 2, or H. 3, 4.
- H. 192. Foreign Policy of the USSR (3). Second semester. Prerequisites,H. 1, 2 and H. 191.Bauer.
- H. 193. History of the Near East (3). First semester. Prerequisites, H. 1, 2, or equivalent. (Not offered in 1949-1950.) Gewehr.
- H. 195. The Far East (3). Second semester. (Not offered in 1949-1950.)

  Gewehr.
- H. 199. Proseminar in Historical Writing (3). Second semester. Staff.

- H. 200. Research (3-6). Credit apportioned to amount of research. First and second semesters. Staff.
- H. 201. Seminar in American History (3). First and second semesters.
- H. 205, 206. Topics in American Economic and Social History (3, 3).Arranged. First and second semesters. Chatelain.
- H. 208. Topics in Recent American History (3). First and second semesters.
  Merrill.
- H. 211. The Colonial Period in American History (3). Arranged. First semester. Ferguson.
- H. 212. Period of the American Revolution (3). Arranged. Second semester.
  Ferguson.
- H. 215. The Old South (3). Merrill.
- H. 216. The American Civil War (3). Merrill.
- H. 221, 222. History of the West (3, 3). Gewehr.
- H. 233, 234. Topics in American Intellectual History (3, 3). Johnson.
- H. 235. Problems in American Constitutional History (3). First and second semesters. Gewehr.
- H. 245. Topics in Latin-American History (3). Selected reading, research, and conferences on important topics in Latin-American History.

Crosman.

- H. 250. Seminar in European History (3). First and second semesters.
- H. 251. Topics in Greek Civilization (3). Readings and conferences designed to acquaint the students with selected topics in Greek and Hellenistic history, such as the growth of democracy in Athens, (with special attention to the nature of democracy in fifth-century Athens) and the development of federalism during the Hellenistic period. Time will also be devoted to the contributions of the Greeks in Philosophy, literature, art, and architecture. Special attention will be given to the study and evaluation of the source material in this field. Jashemski.
- H. 253. Topics in Roman History (3). Readings and conferences designed to acquaint the student with selected topics in Roman history, such as the development of the Roman constitution, the growth of democracy in Rome, Roman provincial administration, the nature of Roman imperialism, and Roman law. Special attention will be given to the study and evaluation of the source material in this field.

Jashemski.

H. 255. Medieval Culture and Society (3).

Jashemski.

- H. 281. Topics in the History of Central Europe (3).
- Prange.
- H. 282. Problems in the History of World War II (3). Investigation of various aspects of the Second World War, including military operations, diplomatic phases, and political and economic problems of the war and its aftermath.
  Prange.
- H. 285, 286. Topics in the History of Modern England and Great Britain (3, 3). Three hours a week, first and second semesters. Gordon.
- H. 287. Historiography (3).

Sparks.

# HOME ECONOMICS

# A. Textiles and Clothing

- Tex. 101. Problems in Textiles (3). One lecture and three laboratory periods a week, first semester. Laboratory fee, \$3.00. Prerequisites, Tex. 100; Organic Chemistry
- Tex. 102. Textile Testing (3). Three laboratory periods a week, second semester. Laboratory fee, \$3.00. Prerequisite, Tex. 100.
- Tex. 103. Textile Microscopy (3). Three laboratory periods a week, second semester. Laboratory fee, \$3.00. Prerequisite, Tex. 101.
- Tex. 105. Consumer Problems in Textiles (3). Two lectures and one laboratory period a week, second semester. Laboratory fee, \$3.00. Prerequisite, Tex. 1, or equivalent.
- Tex. 106. Household Textiles (3). Three laboratory periods a week, first semester. Laboratory fee, \$3.00. Prerequisite, Tex 1. Friemel.
- Tex. 108. Decorative Fabrics (2). One lecture and one laboratory period a week, second semester. Laboratory fee, \$3.00. (Not given in 1950-1951.) Prerequisite, Tex. 1.
- Clo. 120. Draping (3). Three laboratory periods a week, first and second semesters. Laboratory fee, \$3.00. Prerequisite, Clo. 22 Wilbur.
- Clo. 121. Pattern Designs (2). Two laboratory periods a week, second semester, summer session 1950. Laboratory fee, \$3.00. Prerequisite, Clo. 22.
  Wilbur.
- Clo. 122, 125. Tailoring (2, 2). Two laboratory periods a week, first and second semesters, summer session 1950. Laboratory fee, \$3.00 Prerequisite, Clo. 22.
  Mitchell.
- Clo. 123. Children's Clothing (2). One lecture and one laboratory period a week, first and second semesters. Laboratory fee, \$3.00. Prerequisite, Clo. 20A. or 20B, or equivalent.
- Clo. 124. Projects and Readings in Textiles and Clothing (2). Second semester. Laboratory fee, \$3.00.

- Clo. 126. Fundamentals of Fashion (2-3). First semester. Prerequisite, senior standing. Laboratory fee, \$3.00.
- Clo. 127. Apparel Design (3). First and second semesters. Laboratory fee, \$3.00. Prerequisites, Clo. 120; senior standing. Wilbur.
- Clo. 128. Home Furnishings (3). Three laboratory periods a week, second semester. Laboratory fee, \$3.00. Prerequisites, Tex. 1, Clo. 20A or B, or consent of instructor.

- Tex. 200. Special Studies in Textiles (2-4). Laboratory fee, \$3.00.
- Clo. 220. Special Studies in Clothing (2-4). First and second semesters. Laboratory fee, \$3.00. Mitchell.
- Tex. and Clo. 230. Seminar (1). First and second semesters. Laboratory fee, \$3.00.
- Tex. and Clo. 231. Research (2-6). First and second semesters. Laboratory fee, \$3.00.
- Tex. and Clo. 232. Economics of Textiles and Clothing (3). Second semester. Laboratory fee, \$3.00.

# B. Practical Art and Crafts

- Pr. Art 100, 101. Mural Design (2, 2). Two laboratory periods a week, first semester. Laboratory fee, \$3.00. Prerequisites, Pr. Art 1, 2, 3, 21, and consent of the instructor.
- Pr. Art 102, 103. Advanced Mural Design (2, 2). Two laboratory periods a week, first semester. Laboratory fee, \$3.00. Prerequisites, Pr. Art 1, 2, 3, 21, 100, 101.
- Pr. Art 120, 121. Costume Illustration (2, 2). Two laboratory periods a week, first and second semesters. Laboratory fee, \$3.00. Prerequisites, Pr. Art 1, 20, 21, 22, and consent of instructor. Wells.
- Pr. Art 124, 125. Individual Problems in Costume (2, 2). Two laboratory periods a week, first and second semesters. Laboratory fee, \$3.00. Prerequisites, Pr. Art 1, 20, 120, 121, and consent of instructor Wells.
- Pr. Art 132. Advertising Layout (2). Two laboratory periods a week, first and second semesters. Laboratory fee, \$3.00. Prerequisites, Pr. Art 1, 20, 21, 22, 30, and consent of instructor

  Cuneo.
- Pr. Art 134, 135. Individual Problems in Advertising (2, 2). Two laboratory periods a week, second semester. Laboratory fee, \$3.00. Prerequisite, Pr. Art 1, 20, 30, 120, 132, or equivalent, and consent of instructor.

- Pr. Art 136. Merchandise Display (2). Two laboratory periods a week, first and second semesters. Laboratory fee, \$3.00. Prerequisites, Pr. Art 1, 20, 30; 120, 132 to precede or parallel. Wells.
- Pr. Art 137. Advanced Merchandise Display (2). Two laboratory periods a week, first and second semesters. Laboratory fee, \$3.00. Prerequisites, Pr. Art 1, 20, 30, 120, 132, 136, and consent of instructor Wells.
- Pr. Art 138, 139. Advanced Photography (2, 2). Three laboratory periods a week, first and second semesters. Laobratory fee, \$3.00. Prerequisites, Pr. Art 1, 38, 39.
- Pr. Art 140, 141. Interior Design (1, 3). One laboratory period a week, first semester; three laboratory periods a week, second semester. Prerequisites, Pr. Art 1 and Pr. Art 2. Laboratory fee, \$3.00 for 141.

  Brown.
- Pr. Art 142, 143. Advanced Interior Design (2, 2). Two laboratory periods a week, first and second semesters. Laboratory fee, \$3.00. Prerequisites, Pr. Art 1, 140, 141, or equivalent.
- Pr. Art 144, 145. Individual Problems in Interior Design (2, 2). Two laboratory periods a week, first and second semesters. Laboratory fee, \$3.00. Prerequisites, Pr. Art 1, 140, 141, 142, 143, and consent of instructor.
- Cr. 120, 121. Advanced Ceramics (2, 2). Three laboratory periods a week, first and second semesters. Laboratory fee, \$3.00. Prerequisites, Cr. 20, 21.
- Cr. 124, 125. Individual Problems in Ceramics (2, 2). Two laboratory periods a week, first and second semesters. Laboratory fee, \$3.00. Prerequisites, Cr. 20, 21, 120, 121, and consent of instructor. Mahoney.
- Cr. 130, 131. Advanced Metalry (2, 2). Three laboratory periods a week, first and second semesters. Laboratory fee, \$3.00. Prerequisites, Cr. 30, 31.
- Cr. 134, 135. Individual Problems in Metalry (2, 2). Three laboratory periods a week, first and second semesters. Laboratory fee, \$3.00. Prerequisites, Cr. 30, 31, 130, 131, and consent of instructor Lawson.
- Cr. 140, 141. Advanced Weaving (2, 2). Three laboratory periods a week, first and second semesters. Laboratory fee, \$3.00. Prerequisites, Cr. 40, 41.
- Cr. 144, 145. Individual Problems in Weaving (2, 2). Three laboratory periods a week, first and second semesters. Laboratory fee, \$3.00. Prerequisites, Cr. 40, 41, 140, 141, and consent of instructor. Lawson.
- Cr. 198. Crafts in Therapy (2). Second semester. Prerequisites, three courses in various crafts or art construction and consent of instructor. Mahoney.

# C. Home and Institution Management

# FOR GRADUATES AND ADVANCED UNDERGRADUATES

- Home Mgt. 150, 151. Management of Home (3, 3). Three hours a week, first and second semesters. Crow and Burke.
- Home Mgt. 152. Experience in Management of Home (3). First and second semesters. Prerequisites, Home Mgt. 150, 151. Laboratory fee for graduate students, \$7.00.
- Inst. Mgt. 160. Institution Organization and Management (3). Two lectures and one laboratory period a week, first semester. Prerequisites, Foods 2, 3; Nut. 110; Home Mgt. 150, 151 to precede or parallel.

Braucher.

- Inst. Mgt. 161. Institution Purchasing and Accounting (3). Two lectures and one laboratory period a week, second semester. Prerequisite, Inst. Mgt. 160.

  Braucher.
- Inst. Mgt. 162. Institution Foods (3). One lecture and two laboratory periods a week, second semester. Prerequisites, Inst. Mgt. 160, 161.
- Inst. Mgt. 163. Practice in Institution Management (3). Arranged. Three laboratory periods a week. Prerequisites, Inst. Mgt. 160, 161.
- Inst. Mgt. 164. Advanced Institution Management (2). One lecture and one laboratory period a week, second semester. Prerequisites, Inst. Mgt. 160, 161, 162.

  Braucher.
- Inst. Mgt. 165. School Lunch (3). Two lectures and one laboratory period a week, second semester and summer session. Prerequisites, Foods 2, 3; Nut. 110, or equivalent.
- Inst. Mgt. 181. Purchasing and Accounting for Housekeeping Administration (3). Second semester. Prerequisite, Inst. Mgt. 160.
- Inst. Mgt. 182. Housekeeping Management (3). First semester. Prerequisite, Inst. Mgt. 160.
- Inst. Mgt. 183. Problems in Housekeeping Management (3). Second semester. Prerequisites, Inst. Mgt. 160 and Inst. Mgt. 182.

#### D. Foods and Nutrition

- Foods 100. Food Economics (2). One lecture and one laboratory period a week, second semester. Laboratory fee, \$7.00. Prerequisite, Foods 1 or 2, 3.
- Foods 101. Meal Service (2). Two laboratory periods a week, first and second semesters. Laboratory fee, \$7.00. Prerequisite, Foods 1 or 2, 3.

- Foods 102. Experimental Foods (3). One lecture and two laboratory periods a week, first semester. Laboratory fee, \$7.00. Prerequisites, Foods 2, 3; Organic Chemistry, Chem. 31, 32, 33, 34. Peers.
- Foods 103. Demonstrations (2). Two laboratory periods a week, first and second semesters. Laboratory fee, \$7.00. Prerequisites, Clo. 20; Foods 1 or 2, 3; Pr. Art 20; Tex. 1.
- Foods 104. Advanced Foods (2). Two laboratory periods a week, second semester. Laboratory fee, \$7.00. Prerequisite, Foods 1 or 2, 3. Peers.
- Foods 105. Foods of Other Countries (3). One lecture and two laboratory period a week, first semester. Laboratory fee, \$7.00. Prerequisite, Foods 1 or 2, 3, or equivalent.
- Nut. 110. Nutrition (3). First semester. Laboratory fee, \$7.00. Prerequisites, Foods 2, 3; Organic Chemistry, Chem. 31, 32, 33, 34. Braucher.
- Nut. 111. Child Nutrition (2). Laboratory fee, \$7.00. One lecture and one laboratory period a week, second semester. Prerequisite, Foods 1 or 2, 3; Nut. 110 or 10.
- Nut. 112. Dietetics (3). One lecture and two laboratory periods an week, first semester. Laboratory fee, \$7.00. Prerequisite, Nut. 110. Braucher.
- Nut. 113. Dietetics (2). Two periods a week, second semester. Prerequisite, Nut. 110.

- Foods 200. Advanced Experimental Foods (3-5). Laboratory fee, \$7.00. Second semester.
- Nut. 210. Readings in Nutrition (3). First semester.
- Nut. 211. Problems in Nutrition (3-5). Second semester.
- Nut. 212. Nutrition for Community Service (3). First semester.
- Foods and Nut. 204. Recent Advances in Foods and Nutrition (2-3). Second semester.
- Foods and Nut. 220. Seminar (1). First and second semesters.
- Foods and Nut. 221. Research. Laboratory fee, \$7.00. First and second semesters.

### E. Home Economics Extension

FOR GRADUATES AND ADVANCED UNDERGRADUATES

H. E. Ext. 100. Methods in Home Economics Extension (3). Second semester

#### HORTICULTURE

FOR GRADUATES AND ADVANCED UNDERGRADUATES

Hort. 101, 102. Technology of Fruits (2, 2). Two hours a week, first and second semesters. Prerequisite, Bot. 101.

- Hort. 103, 104. Technology of Vegetables (2, 2). Two hours a week, first and second semesters. Prerequisite, Bot. 101. Stark.
- Hort. 105. Technology of Ornamentals (2). Two hours a week, first or second semester. Prerequisite, Bot. 101.
- Hort. 106. World Fruits and Nuts (2). Second semester. Haut.
- Hort. 107, 108. Plant Materials (3, 3). Two lectures and one laboratory period a week, first and second semesters. Prerequisite, Bot. 1.

Cornell.

- Hort. 114. Systematic Pomology (3). Two lectures and one laboratory period a week, first semester. Given in alternate years. Haut.
- Hort. 116. Systematic Olericulture (3). Two lectures and one laboratory period a week, first semester. Given in alternate years. Walls.
- Hort. 122. Special Problems (2, 2). First and second semesters. Credit arranged according to work done. For major students in horticulture or botany.

  Staff.
- Hort. 123. Grading and Judging of Canned and Frozen Products (2). First semester. One lecture and one laboratory period a week. Prerequisites, Hort. 58, 155, 156. Caldwell.
- Hort. 124. Quality Control (3). Second semester. Two lectures and one laboratory period a week. Prerequisite, Hort. 123. Caldwell.
- Hort. 126. Nutritional Analyses of Processed Crops (3). Second semester.

  One lecture and two laboratory period a week. Prerequisites, Chem.
  33 and 34, Bot. 101, Hort. 123. Caldwell.
- Hort. 150, 151. Commercial Floriculture (3, 3). First and second semesters. Two lectures and one laboratory period a week. Prerequisites, Bot. 1, Hort. 11.
- Hort. 155. Commercial Processing I (3). First semester. Two lectures and one laboratory period a week. Laboratory fee, \$5.00. Prerequisites, Chem. 32, 34, Hort. 61

  Walls.
- Hort. 156. Commercial Processing II (2). One lecture and one laboratory period a week. Prerequisite, Hort. 155. Walls.
- Hort. 159. Nursery Management (3). Second semester. Two lectures and one laboratory period a week. Prerequisites or concurrently, Hort. 62; 107; 108. Cornell.

#### FOR GRADUATES

- Hort. 201, 202. Experimental Pomology (3, 3). Three hours a week, first and second semesters. Prerequisite, Bot. 101. Schrader.
- Hort. 203, 204. Experimental Olericulture (2, 2). Two hours a week, first and second semesters. Prerequisite, Bot. 101.

- Hort. 205. Experimental Pomology (3). Second semester. This course is a continuation of Hort. 201, 202. Schrader.
- Hort. 206. Horticulture Cyto-Genetics (3). Second semester. Prerequisites, Zool. 104, Bot. 101, Bot. 201, or equivalents. A course dealing with the field of cyto-genetics in relation to horticulture.
- Hort. 207. Methods of Horticultural Research (3). Second semester. One lecture and one four-hour laboratory period a week. A critical study of research methods which are or may be used in horticulture.

Scott and Staff.

- Hort. 208. Advanced Horticultural Research (2 to 12). First and second semesters. Credit granted according to work done. Staff.
- Hort. 209. Advanced Seminar (1). First and second semesters. Five credit hours for five semesters can be obtained. Oral reports with illustrative material are required on special topics or recent research publications in horticulture.

  Haut and Staff.

# LIBRARY SCIENCE

FOR GRADUATES AND ADVANCED UNDERGRADUATES

# L. S. 101S. School Library Administration (3).

The organization and maintenance of effective library service in the modern school. Planning and equipping library quarters, purpose of the library in the school, standards, instruction in the use of books and libraries, training student assistants, acquisition of materials, repair of books, publicity, exhibits and other practical problems.

# L. S. 102S. Cataloging and Classification (3).

Study and practice in classifying books and making dictionary catalog for school libraries. Simplified forms as used in the Children's Catalog. Standard Catalog for High School Libraries, and Wilson printed cards are studied.

# L. S. 103S. Book Selection for School Libraries (3).

Principles of book selection as applied to school libraries. Practice in the effective use of book selection aids and in the preparation of book lists. Evaluating of publishers, editions, translations, format, etc.

# L. S. 104S. Reference and Bibliography for School Libraries (4).

Evaluation, selection and use of standard reference tools, such as encyclopedias, dictionaries, periodical indexes, atlases and yearbooks, for school libraries. Study of bibliographical procedures and forms.

### **MATHEMATICS**

The Colloquium meets weekly for reports on the research of the faculty and the graduate students, and for expository lectures on papers published in current mathematical journals.

# Special Departmental Requirements

#### MASTER OF ARTS

Before a candidate will be recommended for admission to candidacy the candidate will be required to:

- 1. Demonstrate a reading knowledge of a foreign language of scientific importance.
- 2. Pass a preliminary examination. The examination covers the candidate's mastery of undergraduate and graduate studies in both major and minor fields. Ordinarily only one re-examination, to be held not before a semester has lapsed, may be given.

# DOCTOR OF PHILOSOPHY

Before submitting himself for the preliminary examination required for admission to candidacy, the student is expected to have acquired a background of mathematical knowledge represented by the following group of graduate studies: Analysis, four semesters; Algrebra, two semesters; Geometry or Topology, two semesters; Applied Mathematics or Physics, two semesters.

#### A. Algebra

# FOR GRADUATES AND ADVANCED UNDERGRADUATES

- Math. 100, 101. Higher Algebra (3, 3). Prerequisite, Math. 21 or equivalent. Brigham.
- Math. 102. Theory of Equations (3). (Not offered 1950-1951.) Prerequisite, Math 21 or equivalent. Good.
- Math. 103. Introduction to Modern Algebra (3). Second semester. Prerequisite, Math. 21 or equivalent. Good.
- Math. 106. Introduction to the Theory of Numbers (3). (Not offered 1950-1951.) Prerequisite, Math. 21 or equivalent. Brigham.

#### FOR GRADUATES

- Math. 200, 201. Modern Algebra (3, 3). (Not offered 1950-1951.) Prerequisite, Math. 103 or consent of instructor. Good.
- Math. 202. Matrix Theory (3). (Not offered 1950-1951.) Prerequisite, Math 103 or consent of instructor. Good.
- Math. 204, 205. Topological Groups (3, 3). (Not offered 1950-1951.)
  Prerequisite, consent of instructor. Good, Hall.
- Math. 271. Selected Topics in Algebra (3). Arranged.

# B. Analysis

#### FOR GRADUATES AND ADVANCED UNDERGRADUATES

Math. 110, 111. Advanced Calculus (3, 3). First and second semesters.

Prerequisite, Math 21 or equivalent.

Martin.

- Math. 114, 115. Differential Equations (3, 3). (Math 114, second semester; Math. 115, not offered 1950-1951.) Prerequisite, Math. 21 or equivalent.
- Math. 116, 118. Introduction to Complex Variable Theory (3, 3). Not offered 1950-1951.) Prerequisite, Math. 21 or equivalent. Open to students in engineering and the physical sciences. Graduate students in mathematics should enroll in Math. 210, 211. Truesdell.
- Math. 117. Fourier Series (3). (Not offered 1950-1951.) Prerequisite,
  Math. 114 or equivalent.

  Leutert.

- Math. 210, 211. Functions of a Complex Variable (3, 3). (Not offered 1950-1951.) Prerequisite, Math. 111 or equivalent. Weinstein.
- Math. 213, 214. Functions of a Real Variable (3, 3). Prerequisite, Math. 111 or equivalent. Hall.
- Math. 215, 216. Advanced Differential Equations (3, 3). Prerequisite, Math. 111 and 116, or 210.
- Math. 217, 218. Analytic Number Theory (3, 3). Prerequisite, Math. 106 and 211. Brigham.
- Math. 272. Selected Topics in Analysis (3). Arranged.

# C. Geometry and Topology

# FOR GRADUATES AND ADVANCED UNDERGRADUATES

- Math. 122, 123. Elementary Topology (3, 3). (Not offered 1950-1951.)
  Prerequisite, Math. 21 or equivalent.
- Math. 124, 125. Introduction to Projective Geometry (3, 3). Prerequisite, Math. 21 or equivalent. Jackson.
- Math. 126, 127. Introduction to Differential Geometery and Tensor Analysis (3, 3). (Not offered 1950-1951.) Prerequisite, Math. 21 or equivalent.

  Vanderslice.
- Math. 128, 129. Higher Geometry (3, 3). (Not offered 1950-1951.) Prerequisite, Math. 21 or consent of instructor. Math 128 is not a prerequisite for Math. 129. Open to students in the College of Education.

  Jackson.

#### FOR GRADUATES

- Math. 220, 221. Differential Geometry (3, 3). Prerequisite, Math. 111 and 134, or consent of instructor. Jackson.
- Math. 222. Foundations of Geometry (3). (Not offered 1950-1951.) Prerequisite, Math. 124 or consent of instructor. Jackson.
- Math. 223, 224. Combinatorial Topology (3, 3). (Not offered 1950-1951.)
  Prerequisite, Math. 103 and 111, or equivalent. Hall.

- Math. 225, 226. Set-theoretic Topology (3, 3). Prerequisite, Math. 111 or equivalent.
- Math. 227. Tensor Analysis (3). (Not offered 1950-1951.) Prerequisite,
  Math. 111 and 134, or equivalent. Vanderslice.
- Math.273. Selected Topics in Geometry and Topology (3). Arranged.

# D. Applied Mathematics

#### FOR GRADUATES AND ADVANCED UNDERGRADUATES

- Math. 130, 131. Analytic Mechanics (3, 3). Prerequisite, Math. 21 or equivalent.
- Math. 132, 133. Advanced Mathematics for Engineers and Physicists (3, 3).

  Prerequisite, Math. 21 or equivalent. Vanderslice.
- Math. 134. Vector Analysis (3). (Not offered 1950-1951.) Prerequisite,
  Math. 21 or equivalent. Vanderslice.
- Math. 135. Numerical Analysis (3). (Not offered 1950-1951.) Prerequisite, Math. 114 or equivalent. Polachek.
- Math. 139. Operational Calculus (3). (Not offered 1950-1951.) Prerequisite, Math. 21 or equivalent. Intended for students of engineering and physics.

# FOR GRADUATES

- Math. 230, 231. Applied Mathematics (3, 3). (Not offered 1950-1951.)
  Prerequisite, Math. 111 and 114, or equivalent.

  Martin.
- Math. 232, 233. Partial Differential Equations of Mathematical Physics (3, 3). (Not offered 1950-1951.) Prerequisite, Math. 111 and 114, or equivalent.
- Math. 234. Potential Theory (3). (Not offered 1950-1951.) Prerequisite, Math. 111 or equivalent. Weinstein.
- Math. 235. Advanced Numerical Analysis (3). (Not offered 1950-1951.)
  Prerequisite, Math. 114 and 135, or equivalent. Polachek.
- Math. 236. Mathematical Theory of Hydrodynamics (3). First semester.

  Prerequisite, Math. 116 or equivalent.

  Weinstein.
- Math. 237. Mathematical Theory of Elasticity (3). Second semester.

  Prerequisite, Math. 111 or equivalent.

  Weinstein.
- Math. 238. Mathematical Theory of Continuous Media (3). Not offered 1950-1951.) Prerequisite, Math. 134 or consent of instructor Truesdell.
- Math. 239. Mathematical Theory of Electricity and Magnetism (3). (Not offered 1950-1951.) Prerequisite, Math. 134 or consent of instructor.

  Truesdell.
- Math. 274. Selected Topics in Applied Mathematics (3). Arranged

### E. Statistics

## FOR GRADUATES AND ADVANCED UNDERGRADUATES

- Math. 150, 151. Probability (3, 3). Prerequisite, Math. 21 or equivalent. Good.
- Math. 152, 153. Mathematical Statistics (2, 2). (Not offered 1950-1951.)

  Prerequisite, Math. 21 or equivalent. Good.
- Math. 154, 155. Applications of Statistics (3, 3). (Not offered 1950-1951.)

  Two lectures and one two-hour laboratory period per week. Prerequisite, Math. 21 or equivalent.

  Good.

### F. Research

# FOR GRADUATES

- Math. 298. Proseminar in Research (2). Second semester. Prerequisite, one semester of graduate work in mathematics. Staff.
- Math. 300. Research. Arranged.

## PHILOSOPHY

- Phil. 101. Ancient Philosophy (3). First semester. Robinson.
- Phil. 102. Modern Philosophy (3). Second semester. Prerequisite, Phil. 101. Robinson.
- Phil. 111. Medieval Philosophy (3). Second semester. Prerequisite, Phil. 101. Robinson.
- Phil. 112. Recent and Contemporary Philosophy (3). First semester. Prerequisite, Phil. 101 and 102, or written permission of instructor. (Not offered in 1950-1951.)
- Phil. 121. American Philosophy (3). Second semester. Dewey.
- Phil. 151. Ethics (3). First semester. Prerequisite, Phil. 2 or one year of Phil.

  Baylis.
- Phil. 153. Philosophy of Art (3). First semester. Dewey.
- Phil. 154. Political and Social Philosophy (3). First semester. Dewey.
- Phil. 155. Logic (3). Each semester. Baylis.
- Phil. 156. Philosophy of Science. (3). First semester. Robinson.
- Phil. 160. Metaphysics (3). Second semester. (Offered in 1950-1951, 1951-1952, and alternatively with Phil. 111.) Robinson.
- Phil. 191. Topical Investigations (3). Each semester. Staff.

Graduate instruction in the Department of Philosophy is carried on mainly by independent investigation of special topics under individual supervision. Any of the courses listed below may be elected more than once. Course selections require the approval of the department chairman.

- Phil. 201. Research in Philosophy (3). Each semester. Staff.
- Phil. 203. Selected Problems in Philosophy (3). Each semester. Staff.
- Phil. 205. Seminar in the History of Philosophy (3). First semester. Staff.
- Phil. 206. Seminar in the Problems of Philosophy (3). Second semester.

  Staff.

#### PHYSICAL EDUCATION, RECREATION AND HEALTH

FOR GRADUATES AND ADVANCED UNDERGRADUATES

Course starred (\*) may be taken for graduate credit.

- P. E. 100. Kinesiology (3). First and second semesters.
- \*P. E. 101, 103. Organization and Officiating in Intramurals (2, 2). First and second semesters.
- \*P. E. 112. History of Dance (3). First semester. Prerequisites, P. E. 52, 54, 56, 58 or permission of instructor.
- P. E. 113, 115. Methods and Materials for Secondary Schools I (3, 3). Two lectures and two laboratories a week.
- P. E. 114, 116. Methods and Materials for Secondary Schools II (3, 3). Two lectures and two laboratories a week.
- P. E. 120. Physical Education for the Elementary Schools (2). First and second semesters and summer.
- \*P. E. 123, 125. Coaching Athletics (3, 3). First and second semesters. Two lectures and two laboratory periods a week.
- \*P. E. 124, 126. Methods and Materials in Team Sports (2, 2). Four laboratory hours a week. Prerequisites, P. E. 62, 64, 66, 68.
- \*P. E. 140. Therapeutics (3). First and second semesters. Prerequisite, P. E. 100.
- \*P. E. 170. Principles and Philosophy of Physical Education (3). First and second semesters.
- \*P. E. 180. Measurements in Health and Physical Education (3). First and second semesters. Two lectures and two laboratory periods a week.
- \*P. E. 181. Training and Conditioning (3). Second semester. Two lectures and two laboratory periods a week.
- \*P. E. 190. Administration and Supervision of Physical Education, Recreation and Health (3). First and second semesters.

- P. E. 200. Departmental Seminar (1-2). First and second semesters and summer.
- P. E. 201. Foundations in Physical Education, Health and Recreation (3). First and second semesters and summer.
- P. E. 203. Supervisory Techniques in Physical Education, Health and Recreation (3). First and second semesters and alternate summers.
- P. E. 205. Administration of Athletics (2). First and second semesters and summer.
- P. E. 210. Comparative Problems in Physical Education (2). First and second semesters.
- P. E. 230. Contemporary Physical Education (3). First and second semesters and alternate summers.
- P. E. 250. Survey in Area of Physical Education, Health and Recreation (3-6). First and second semesters and summer.
- P. E. 260. Research (1-6). First and second semesters and summer.

### A. Health Education

Courses starred (\*) may be taken for graduate credit.

- \*Hea. 110. Health Service and Supervision (2). First and second semesters.
- Hea. 112. Home Nursing (2). First semester.
- \*Hea. 114. Health Education for Elementary Schools (2). First and second semesters.
- \*Hea. 120. Teaching Health (2). First and second semesters. Prerequisite, Hea. 40 or equivalent.
- \*Hea. 130. Organization and Administration of Health Education (3).
  First and second semesters.
- \*Hea. 160. Problems in School Health Education (4-6). Summers only.

### FOR GRADUATES

- Hea. 220. Principles and Practices of Health Education (3). First and second semesters and alternate summers.
- Hea. 240. Advancements in Modern Health (3). First and second semesters and summer.

# B. Recreation

FOR GRADUATES AND ADVANCED UNDERGRADUATES

Courses starred (\*) may be taken for graduate credit.

Rec. 100. Co-recreational Games and Programs (2). First and second semesters. Four laboratory periods a week.

- Rec. 102. Recreational Games for the Elementary Schools (2). First semester.
- Rec. 110. Nature Lore (1-3). Second semester.
- Rec. 120. Camp Administration and Leadership (3). First and second semesters.
- \*Rec. 130. Principles and Practice of Recreation (3). First and second semesters.
  - Rec. 140. Observation and Service in Recreation (5). First and second semesters.
  - Rec. 160. Recreational Golf (1). Second semester and summer.
- \*Rec. 170. Organization and Administration of Recreation (3). First and second semesters.
- \*Rec. 184. Outdoor Education (3-6). Summer only.

- Rec. 210. Philosophy of Recreation (2). First and second semesters and alternate summers.
- Rec. 220. Contemporary Recreation (3). First and second semesters and alternate summers.

#### PHYSICS

# A. General Physics

- Phys. 100. Advanced Experiments. Three hours' laboratory work for each credit hour. One or more credits may be taken concurrently. Prerequisites, Phys. 52 or 54 and four credits in Phys. 60. Laboratory fee, \$6.00 per credit hour.
- Phys. 102. Optics (3). Three lectures a week, second semester. Prerequisites, Phys. 11 or 21; Math. 21.

  Myers.
- Phys. 104. Electricity and Magnetism (4). Four lectures a week, first semester. Prerequisites, Phys. 11 or 21; Math. 21. Iskraut.
- Phys. 106. 107.. Theoretical Mechanics (3, 3). Three lectures a week, first and second semesters. Prerequisites, Phys. 51 or consent of instructor.

  Morgan.
- Phys. 112, 113. Modern Physics (2, 2). Two lectures a week. Prerequisite, advanced standing in physics and mathematics. Iskraut.
- Phys. 120, 121. Experimental Nuclear Physics (3, 3). Off-campus. Two lectures and one laboratory a week. Prerequisite, Phys. 113 and two credits of Phys. 100.

  Johnson.

Phys. 126. Kinetic Theory of Gases (3). Off-campus. Prerequisites, Phys. 107 and Math. 21, or equivalent.

## FOR GRADUATES

- Of the following courses, 200, 201, 212 and 213 are given every year; all others will be given according to the demand.
- Phys. 200, 201. Introduction to Theoretical Physics (5, 5). Five lectures a week, first and second semesters. Prerequisite, advanced standing in physics and mathematics.

  Myers.
- Phys 202, 203. Advanced Dynamics (2, 2). Two lectures a week. Prequisite, Phys. 200.
- Phys. 204. Electrodynamics (4). Four lectures a week. Prerequisite, Phys. 201.
- Phys. 206. Physical Optics (3). Prerequisite, Phys. 201. Myers.
- Phys. 208, 209. Thermodynamics (2, 2). Prerequisite, Phys. 201 or equivalent. Wangrness
- Phys. 210, 211. Statistical Mechanics and the Kinetic Theory of Gases (2, 2). Two lectures a week. Prerequisites, Phys. 112 and 201.

McMillen.

Phys. 212, 213. Introduction to Quantum Mechanics (3, 3). Three lectures a week, first and second semesters. Prerequisite, Phys. 213.

Brickwedde.

- Phys. 214, 215. Theory of Atomic Structure and Spectral Lines (2, 2).

  Two lectures a week. Prerequisite, Phys. 213.

  McMillen.
- Phys. 216, 217. Molecular Structure (2, 2). Two lectures a week. Prerequisite, Phys. 213.

  Brickwedde.
- Phys. 222, 223. Boundary-Value Problems of Theoretical Physics (2, 2). Prerequisite, Phys. 201.
- Phys. 228, 229. The Electron (2, 2). Prerequisites, Phys. 204 and Phys. 213.
- Phys. 230. Seminar (1). First and second semesters.
- Phys. 234, 235. Nuclear Physics (2, 2). Prerequisite, Phys. 213. Johnson.
- Phys. 236. Theory of Relativity (3). Prerequisite, Phys. 200. Iskraut.
- Phys. 238. Quantum Theory—selected topics (3). Prerequisite, Phys. 236. Iskraut.
- Phys. 242, 243. Theory of Solids (2, 2). Two lectures a week, first and second semesters. Prerequisite, Phys. 213.

  Myers.
- Phys. 250. Research. Credit according to work done. Laboratory fee, \$6.00 per credit hour.

# B. Applied Physics

## FOR GRADUATES AND ADVANCED UNDERGRADUATES

- Phys. 101. Laboratory Arts (1). Four hours laboratory a week, second semester. Prerequisite, two credits Phys. 100. Laboratory fee, \$6.00.
- Phys. 103. Applied Optics (3). First semester. Three lectures a week. Prerequisite, Phys. 102.
- Phys. 105. Electricity and Magnetism (2). Two lectures a week, second semester. Prerequisite, Phys. 104.

  Iskraut.
- Phys. 108. Physics of Vacuum Tubes (3). First semester. Three lectures a week. Prerequisite, Phys. 104.
- Phys. 109. Electronic Circuits (5). Second semester. Five lectures a week. Prerequisite, Phys. 105.
- Phys. 110. Applied Physics Laboratory (1, 2, or 3). Three hours laboratory work for each credit hour. One to three credits may be taken concurrently. Prerequisites, Phys. 52 or Phys. 54; and two credits in Phys. 60.
- Phys. 116, 117. Fundamental Hydrodynamics (3, 3). Three lectures a week. Prerequisite, Physics 107 and Math. 21.

### FOR GRADUATES

- Phys. 218, 219. X-Rays and Crystal Structure (3, 3). Three lectures a week, first and second semesters. Morgan.
- Phys. 220. Application of X-Ray and Electron Diffraction Methods (2).

  Two laboratory periods a week.

  Morgan.
- Phys. 224,225. Supersonic Aerodynamics and Compressible Flow (2, 2).

  Prerequisite, Phys. 201.

  Morgan.
- Phys. 226, 227. Fluiddynamics (3, 3). Prerequisite, Phys. 201.
- Phys. 232, 233. Hydromechanics Seminar (1, 1). Kennard.
- Phys. 240, 241. Theory of Sound and Vibrations (2, 2). Prerequisite, Phys. 201. McMillen.

# POULTRY HUSBANDRY

- P. H. 104. Poultry Marketing (3). Two lectures and one laboratory period a week, first semester. Gwin.
- P. H. 105. Egg Marketing (3). Two lectures and one laboratory period a week, second semester. Gwin.
- P. H. 107. Poultry Industrial and Economic Problems. (2). First semester.

  Staff.

- P. H. 108. Special Poultry Problems (1-2). Assigned problems, first and second semesters. Staff.
- Poultry Hygiene. See V. S. 107.
- Avian Anatomy. See V. S. 108.

- P. H. 201. Advanced Poultry Genetics (3). First semester. Prerequisite, P. H. 100, or equivalent. Jull.
- P. H. 202. Advanced Poultry Nutrition (3). Two lectures and one laboratory period a week, second semester. Prerequisite, P. H. 101, or equivalent.
- P. H. 203. Physiology of Reproduction of Poultry (3). Two lectures and one laboratory period a week, first semester. Prerequisite, P. H. 102, or equivalent.
- P. H. 204. Poultry Seminar (1). First and second semesters. Staff.
- P. H. 205. Poultry Literature (1-4). First and second semesters. Staff.
- P. H. 206. Poultry Research (1-6). Credit in accordance with work done.

  Staff.
- P. H. 207. Poultry Research Techniques (2). One lecture and one laboratory period a week, first semester. Staff.

# **PSYCHOLOGY**

#### FOR GRADUATES AND ADVANCED UNDERGRADUATES

Graduate credit will be assigned only for students certified by the Department of Psychology as qualified for graduate standing.

- Psych. 106 Statistical Methods in Psychology (3). First and second semesters. Prerequisite, Psych. 1 or 3. Schaefer.
- Psych. 110. Advanced Educational Psychology (3). First semester. Prerequisite, Psych. 1 or 3 or H. D. Ed. 101. Grzeda.
- Psych. 121. Social Psychology (3). First and second semesters. Prerequisite, Psych. 1 or 3. Grzeda.
- Psych. 122. Advanced Social Psychology (3). Second semester. Prerequisite, Psych. 121 and consent of instructor.
- Psych. 125. Child Psychology (3). First semester. Prerequisite, Psych. 1 or 3. Grzeda.
- Psych. 126. Developmental Psychology (3). Second semester. Prerequisite, Psych. 1 or 3.
- Psych. 128. Human Motivation (3). First semester. Prerequisite, Psych. 121.

- Psych. 129. Psychological Aspects of Literature (3). First semester. Prerequisite, Psych. 1 or 3 or permission of instructor. Sprowls.
- Psych. 131. Abnormal Psychology (3). First and second semesters. Prerequisite, 3 courses in Psychology. Sprowls.
- Psych. 136. Applied Experimental Psychology (3). Second semester. Prerequisite, Psych. 1 or 3. Walker.
- Psych. 140. Psychological Problems in Advertising (3). First semester. Prerequisite, Psych. 1 or 3. Hackman.
- Psych. 142. Techniques of Interrogation (3). Second semester. Prerequisite, Psych. 121.
- Psych. 145. Introduction to Experimental Psychology (3). First and second semesters. Prerequisite, Psych. 4. Laboratory fee, \$4.00. Walker.
- Psych. 150. Tests and Measurements (3). First semester. Prerequisite, Psych. 106. Laboratory fee, \$4.00.
- Psych. 155. Psychological Techniques in Vocational Counseling (3). Second semester. Prerequisite, Psych. 150.

  Smith.
- Psych. 161. Psychological Techniques in Personnel Administration (3).

  Second semester. Prerequisite, 6 hours in Psychology. Schaefer.
- Psych. 167. Psychological Problems in Aviation (3). Second semester.

  Prerequisite, Psych. 1 or 3. Walker.
- Psych. 180. Physiological Psychology (3). First semester. Prerequisite, Psych. 145. Andrews, Walker.
- Psych. 191, 192. Advanced General Psychology (3, 3). First and second semesters.
- Psych. 194. Independent Study in Psychology (1-3). First and second semesters. Prerequisite, senior standing and consent of instructor.

  Staff.
- Psych. 195. Minor Problems in Psychology (1-3). First and second semesters. Prerequisite, senior standing and consent of instructor. Staff.
- Psych. 198. Proseminar: Professional Aspects of Psychological Science
   (3). Second semester. Prerequisites, senior standing and consent of instructor.

- Psych. 202. Seminar in Advanced Experimental Psychology (3). First semester. Prerequisite, permission of instructor. Andrews.
- Psych. 203, 204.—Graduate Seminar (3, 3). First and second semesters.

  Prerequisite, consent of instructor.

  Staff.
- Psych. 205, 206. Historical Viewpoints and Current Theories in Psychology (3, 3). First and second semesters. Cofer.

- Psych. 210. Occupational Information (3). Second semester. Prerequisite, Psych. 150.
- Psych. 211. Job Analysis and Description (3). First semester. Prerequisite, Psych. 210.
- Psych. 220, 221. Counseling Techniques (3, 3). First and second semesters. Prerequisite, Psych. 210.
- Psych. 222. Rehabilitation Techniques (3). Second semester. Prerequisite, Psych. 220.
- Psych. 223. Diagnosis and Correction of Reading Difficulties (3). First semester. Prerequisite, Psych. 221.
- Psych. 224. Counseling for Marital Problems (3). Second semester. Prerequisite, Psych. 221.
- Psych. 225. Participation in Counseling Clinic (3). First semester. Prerequisite, Psych. 221.
- Psych. 230. Determinants of Human Efficiency (3). Second semester. Prerequisite, Psych. 128. Walker.
- Psych. 231. Training Procedures in Industry (3). First semester. Prerequisite, Psych. 230.
- Psych. 233. Social Organization in Industry (3). First semester. Prerequisite, Psych. 230.
- Psych. 240. Interview and Questionnaire Techniques (3). Second semester.

  Prerequisite, Psych. 150.

  Hackman.
- Psych. 241. Controlled Publicity (3). First semester. Prerequisite, consent of instructor.
- Psych. 250, 251. Development and Validation of Predictors (3, 3). First and second semesters. Prerequisites. Psych. 150 and 253. Schaefer.
- Psych. 252, 253. Advanced Statistics (3, 3). First and second semesters. Prerequisite, Psych. 106. Hackman.
- Psych. 260, 261. Individual Tests (3, 3). First and second semesters. Laboratory fee, \$4.00. Prerequisite, Psych. 150. Cofer.
- Psych. 262. Appraisal of Personality (3). First semester. Prerequisite, Psych. 150.
- Psych. 264, 265. Projective Tests (3, 3). First and second semesters.

  Laboratory fee, \$4.00. Prerequisite, Psych. 261. Cofer.
- Psych. 266, 267. Theories of Personality and Motivation (3, 3). First and second semesters.
- Psych. 270. Advanced Abnormal Psychology (3). First semester. Prerequisite, Psych. 131.

- Psych. 271. Special Testing of Disabilities (3). Second semester. Prerequisite, Psych. 270.
- Psych. 272, 273. Individual Clinical Diagnosis (3, 3). First and second semesters. Prerequisite, Psych. 261. Cofer.
- Psych. 274. Individual Therapy (3). First semester. Prerequisite, Psych. 261.
- Psych. 275. Group Therapy (3). Second semester. Prerequisite, Psych. 274.
- Psych. 278. Seminar in Clinical Psychology for Teachers (3). First semester. Prerequisite, consent of instructor. Sprowls.
- Psych. 280. Advanced Psychophysiology (3). Second semester. Prerequisite, consent of instructor. Andrews.
- Psych. 290, 291. Research for Thesis (credit arranged). First and second semesters. Staff.

# SOCIOLOGY

- Soc. 105. Applied Anthropology (3). Second semester. Hutchinson.
- Soc. 112. Rural-Urban Relations (3). First semester. Melvin.
- Soc. 113. The Rural Community (3). Second semester. Prerequisite, Soc. 1, or its equivalent. Hoffsommer.
- Soc. 114. The City (3). First semester. Prerequisite, Soc. 1, or its equivalent.
- Soc. 115. Industrial Sociology (3). Second semester. Prerequisite, Soc. 1, or its equivalent.
- Soc. 118. Community Organization (3). Second semester. Prerequisite, Soc. 1, or its equivalent. Bailey.
- Soc. 121, 122. Population (3, 3). Three hours a week, first and second semesters. Prerequisite, Soc. 1, or its equivalent. Baker.
- Soc. 123. Ethnic Minorities (3). First semester. Prerequisite, Soc. 1, or its equivalent. Lejins.
- Soc. 124. The Culture of the American Indian (3). Second semester.

  Prerequisite, Soc. 1, or its equivalent.

  Hutchinson.
- Soc. 131. Introduction to Social Service (3). First semester. Prerequisite, Soc. 1, or its equivalent. Willner.
- Soc. 141. Sociology of Personality (3). First semester. Prerequisite, Soc. 1, or its equivalent. Ebersole.
- Soc. 144. Collective Behavior (3). Second semester. Prerequisite, Soc. 1, or its equivalent. Ebersole.

Lejins.

- Soc. 145. Social Control (3). First semester. Prerequisite, Soc. 1, or its equivalent. Ebersole.
- Soc. 147. Sociology of Law (3). First semester. Prerequisite, Soc. 1, or its equivalent. Lejins.
- Soc. 153. Juvenile Delinquency (3). First semester. Prerequisite, Soc. 1, or its equivalent. Lejins.
- Soc. 154. Crime and Delinquency Prevention (3). Second semester. Prerequisites, Soc. 1, or its equivalent; Soc. 52, Soc. 153, or consent of instructor.

  Lejins.
- Soc. 156. Institutional Treatment of Criminals and Delinquents (3). Second semester. Prerequisites, Soc. 1, or its equivalent; Soc. 52, Soc. 153, or consent of instructor.
- Soc. 161. The Sociology of War (3). First semester. Bailey.
- Soc. 171. Family and Child Welfare (3). First semester. Prerequisite, Soc. 1, or its equivalent. Shankweiler.
- Soc. 173. Social Security (3). First semester. Prerequisite, Soc. 1, or its equivalent. Hutchinson.
- Soc. 174. Public Welfare (3). Second semester. Prerequisite, Soc. 1, or its equivalent. Willner.
- Soc. 183. Social Statistics (3). Second semester. Prerequisite, Soc. 1, or its equivalent.
- Soc. 185. Advanced Social Statistics (3). Second semester. Prerequisite, Soc. 183, or equivalent.
- Soc. 186. Sociological Theory (3). Second semester. Prerequisite, Soc. 1, or its equivalent.

  Bailey.
- Soc. 196. Senior Seminar (3). Second semester. Prerequisite, senior standing with major in Sociology. Hoffsommer.

# FOR GRADUATES

- Soc. 201. Methods of Social Research (3). First semester. Hoffsommer.
- Soc. 215. Community Studies (3). First semester. Hoffsommer.
- Soc. 221. Population and Society (3). Second semester. Staff.
- Soc. 224. Race and Culture (3). Second semester. Staff.
- Soc. 241. Personality and Social Structure (3). Second semester. Staff.
- Soc. 246. Public Opinion and Propaganda (3). Second semester. Staff.
- The second composition and second composition of the second compositio
- Soc. 254. Seminar: Criminology (3). Second semester. Lejins.

Advanced Criminology (3). First semester.

Soc. 253.

Soc. 255. Seminar: Juvenile Delinquency (3). First semester. Lejins.

Sos.	256.	Crime	and	Delinquency	as	a	Community	Problem	(3).	Second
semester.									Lejins.	

Soc. 257. Social Change and Social Policy (3). First semester. Staff.

Soc. 262. Family Studies (3). Second semester. Shankweiler.

Soc. 282. Sociological Methodology (3). Second semester. Staff.

Soc. 285. Seminar: Socological Theory (3). First semester. Bailey.

Soc. 290. Research in Sociology. Credit to be determined.

Staff.

Soc. 291. Special Social Problems. First and second semesters. Credit to be determined. Staff.

# SPEECH AND DRAMATIC ART

- Speech 101. Radio Speech (3). First semester. Prerequisite, Speech 4, Laboratory fee, \$2.00. Batka.
- Speech 102. Radio Production (3). Second semester. Consent of instructor. Laboratory fee, \$2.00.
- Speech 103, 104. Speech Composition and Rhetoric (3, 3). First and second semesters. (Not offered 1950-51.) Golden.
- Speech 105. Pathology (3). First semester. . Ansberry.
- Speech 106. Clinic (3). Second semester. Prerequisite, Speech 105.

  Ansberry
- Speech 107. Advanced Oral Interpretation (3). Second semester. Prerequisite, Speech 13. Provenson.
- Speech 110. Teacher Problems in Speech (3). Second semester. For students who intend to teach.

  Hendricks.
- Speech 111. Seminar (3). Second semester. Ehrensberger.
- Speech 112. Phonetics (3). Second semester. Ansberry.
- Speech 113. Play Production (3). Second semester. Harris and Staff.
- Speech 114. Costuming (3). First semester. One lecture and two laboratories a week. (Not offered 1950-51.)
- Speech 115. Radio in Retailing (3). First semester. Prerequisites, Speech 1, 2; English 1, 2. Laboratory fee, \$2.00. Batka.
- Speech 116. Radio Announcing (3). Second semester. Prerequisite, Speech 101. Laboratory fee, \$2.00. Batka.
- Speech 117. Radio Continuity Writing (3). First semester. A study of the principles and methods of writing for broadcasting. Application will be made in the writing of the general types of continuity. Admission by consent of instructor. Coppinger.

- Speech 118. Advanced Radio Writing (3). Second semester. Prerequisite,
  Speech 117. Advanced work with emphasis upon the dramatic form.
  Admission by consent of instructor. Coppinger.
- Speech 119. Radio Acting (3). Second semester. A workshop course designed to give the student practice in radio acting. Admission by consent of the instructor..

  Batka.
- Speech 120. Speech Correction (3). Second semester. Prerequisite, Speech 105. A continuation of Speech 105. Ansberry.
- Speech 121. Stage Design (3). Second semester. Prerequisites, Speech 14, 15. The planning of stage settings and the application of the principles of design to the dramatic production. Admission by consent of the instructor.
- Speech 122, 123. Radio Workship (3, 3). First and second semesters. A laboratory course dealing with all phases of producing a radio program. Admission by consent of instructor. Laboratory fee, \$2.00. Batka.
- Speech 124, 125. American Public Address (3, 3). First and second semesters. The first semester covers the period from Colonial times to the Civil War period. The second semester covers from the Civil War period through the contemporary period.
- Speech 126. Semantic Aspects of Speech Behavior (3). First semester.

  An analysis of speech and language habits from the standpoint of General Semantics.

  Hendricks.
- Speech 131. History of the Theatre (3). First semester. A survey of dramatic production from early origins to 1800. Niemeyer.
- Speech 132. History of the Theatre (3). Second semester. A survey of dramatic production from 1800 to the present. Niemeyer.

The Department maintains a reciprocal agreement with Walter Reed General Hospital whereby clinical practice may be obtained at the Army Audiology and Speech Correction Center, Forest Glen, Maryland.

- Speech 200. Thesis (3-6). Credit in proportion to work done and results accomplished. Ehrensberger.
- Speech 201. Special Problems (2-4). Arranged. Ehrensberger.
- Speech 210. Anatomy and Physiology of Speech and Hearing (3). A study of the anatomy and physiology of the auditory and speech mechanisms.

  Glorig.
- Speech 211. Advanced Clinical Practice (3). A comprehensive survey of the entire field of present-day clinical practice. Glorig.
- Speech 212. Advanced Speech Pathology (3). Etiology and therapy for organic and functional speech disorders.

  Daugherty.

Speech 213. Speech Problems of the Hard of Hearing (3). Correction of abnormal speech habits and instruction in speech conservation.

Daugherty.

- Speech 214. Clinical Audiometry (3). Testing of auditory acuity with pure tones and speech. Sonday.
- Speech 215. Auditory Training (3). Orientation and adjustment of patients in the use of hearing aids.

  Avery.
- Speech 216. Speech Reading (3). A course of training designed to present the fundamentals of speech reading.

  Bartlett and Staff.
- Speech 217. Clinical Practice in the Selection of Prosthetic Appliances (3).

  A laboratory course in modern methods of utilizing electronic hearing aids.

  Sonday and Staff.
- Speech 218. Problems of Hearing and Deafness (3). The adjustment of the individual with a hearing impairment socially, emotionally and vocationally.

  Avery and Staff.

# VETERINARY SCIENCE

# FOR GRADUATES AND ADVANCED UNDERGRADUATES

- V. S. 101. Comparative Anatomy (3). Two lectures and one laboratory period a week, first semester Coffin.
- V. S. 102. Animal Hygiene (3). Two lectures and one laboratory period a week, second semester.
- V. S. 103. Regional Comparative Anatomy (3). One lecture and one laboratory period a week, first semester.
- V. S. 104. Advanced Regional Comparative Anatomy (2). Two laboratory periods a week, second semester. Coffin.
- V. S. 108. Avian Anatomy (3). Two lectures and one laboratory period a week, first semester.

  DeVolt.
- V. S. 107. Poultry Hygiene (3). Two lectures and one laboratory period a week, second semester.

  DeVolt.

## FOR GRADUATES

V. S. 201. Animal Disease Problems (2-6). Arranged. Staff.

V. S. 202. Animal Disease Research. Arranged. Staff.

V. S. 203. Electron Microscopy (2). One lecture and one laboratory period a week, second semester. Reagan and Brueckner.

### ZOOLOGY

### FOR GRADUATES AND ADVANCED UNDERGRADUATES

Zool. 101. Mammalian Anatomy (3). Three laboratory periods a week, second semester. Laboratory fee, \$8.00. Prerequisite, permission of instructor.

- Zool. 102. General Animal Physiology (4). Two lectures and two laboratory periods a week, second semester. Laboratory fee, \$8.00. Prerequisites, one year of Chemistry, one course in Zoology. Phillips.
- Zool. 104. Genetics (3). First semester. Three lecture periods a week.

  Prerequisite, one course in Zoology or Botany.

  Burhoe.
- Zool. 108. Animal Histology (4). Two lecture and two laboratory periods a week, first semester. Laboratory fee, \$8.00. Prerequisite, one year of Zoology.
- Zool. 110. Parasitology (4). First semester. Two lectures and two laboratory periods a week. Laboratory fee, \$8.00. Prerequisite, one year of Zoology. Negherbon.
- Zool. 116. Protozoology (4). Second semester. Two lectures and two laboratory periods a week. Laboratory fee, \$8.00. Prerequisites, Histology; Bacteriology desirable.
- Zool. 118. Invertebrate Zoology (4). Two lectures and two laboratory periods a week, first semester. Laboratory fee, \$8.00. Prerequisites, General Zoology and Vertebrate Embryology.
- Zool. 121. Principles of Animal Ecology (3). Two lectures and one laboratory period a week, second semester. Laboratory fee, \$8.00. Prequisites, one course in Zoology and one course in Chemistry. Littleford.
- Zool. 125, 126. Fishery Biology and Management (3, 3). First and second semesters. Two lectures and one laboratory period a week. Prerequisite, consent of instructor. Laboratory fee on 125, \$8.00. A study of the biology and economic development of fresh and salt water forms. Particular attention is given to practical applications in fisheries work. The first semester of the course deals with problems relating to fin fishes. The second semester considers shell fish and other invertebrates of economic importance. (Littleford.)
- Zool. 130. Aviation Physiology (3). Three lectures a week, second semester. Prerequisite, permission of the instructor. Reynolds.
- Zool. 132. Applied Physiology (3). Three lectures a week, first semester.

  Prerequisite, permission of the instructor.

  King.

Zool. 200. Ichthyology and Marine Zoology (4). Two lectures and two laboratory periods a week, first semester. Laboratory fee, \$8.00.

Littleford.

- Zool. 201. Microscopical Anatomy (4). Two lectures and two laboratory periods a week, second semester. Laboratory fee, \$8.00.
- Zool. 202. Animal Cytology (4). Two lecture and two laboratory periods a week, first semester. Laboratory fee, \$8.00. Negherbon.

- Zool. 203. Advanced Embryology (4). Two lectures and two laboratory periods a week, second semester. Laboratory fee, \$8.00. Burhoe.
- Zool. 204. Advanced Animal Physiology (4). Two lectures and two laboraratory periods a week, first semester. Laboratory fee, \$8.00. Phillips.
- Zool. 205. Hydrobiology (4). Two lectures and two laboratory periods a week, second semester. Laboratory fee, \$8.00. Littleford.
- **Zool. 206.** Research. Credit to be arranged. First and second semesters. Laboratory fee, \$8.00.
- Zool. 207. Zoology Seminar (1). First and second semesters. One lecture a week.
- Zool. 208. Special Problems in General Physiology. Hours and credits arranged. Second semester. Laboratory fee, \$8.00. Phillips.
- Zool. 220. Advanced Genetics (3). Two lectures and one laboratory period a week, first semester. Laboratory fee, \$8.00. Prerequisite, Zool. 104.

  Burboe.

# SCHOOL OF DENTISTRY

# ANATOMY

FOR GRADUATES AND ADVANCED UNDERGRADUATES

Anatomy 111. Human Gross Anatomy (8). Two lectures and two laboratory periods per week throughout the year.

Hahn, Thompson, Hewes.

Anatomy 113. Human Neuroanatomy (2). Two lectures and two laboratory periods for eight weeks. Hahn, Thompson, Hewes.

#### FOR GRADUATES

- Anatomy 211. Human Gross Anatomy. Credits to be arranged. Same as course 111 but with additional instruction. Hahn, Thompson.
- Anatomy 213. Human Neuroanatomy. Credits to be arranged. Same as course 113 but with additional instruction. Hahn, Thompson.
- Anatomy 216. Research. Time and credit by arrangement. Staff.

## BACTERIOLOGY

See Bacteriology Courses listed under "School of Pharmacy."

#### BIOCHEMISTRY

FOR GRADUATES AND ADVANCED UNDERGRADUATES

Biochemistry 111. Principles of Biochemistry (6). Two lectures, one conference and one laboratory period per week throughout the year.

Vanden Bosche.

- Biochemistry 211. Advanced Biochemistry. Time and credits by arrangement.

  Vanden Bosche.
- Biochemistry 212. Research in Biochemistry. Time and credits by arrangement. Prerequisite, 211. Vanden Bosche.

## HISTOLOGY AND EMBRYOLOGY

FOR GRADUATES AND ADVANCED UNDERGRADUATES

Histology 112. Mammalian Histology and Embryology (6). Two lectures and two laboratory periods per week throughout the year. McCrea.

### FOR GRADUATES

- Histology 212. Mammalian Histology and Embryology. Number of credits by arrangement. Same as course 112 but with additional work and instruction of a more advanced nature.

  McCrea.
- Research in Histology 214. Number of hours and credit by arrangement.

  Prerequisite, 112 or 212.

  McCrea.
- Research in Embryology 215. Number of hours and credit by arrangement. Prerequisites by arrangement. McCrea.

### PHYSIOLOGY

FOR GRADUATES AND ADVANCED UNDERGRADUATES

Physiology 111. Principles of Physiology (6). Two lectures and one laboratory period per week throughout the year. Oster, Shipley, Pollack.

## FOR GRADUATES

- Physiology 211. Advanced Physiology (2). Two lectures and one conference period per week for one semester. Staff.
- Physiology 212. Mammalian Physiology (2). Two lectures and one conference period per week for one semester. Oster, Shipley, Pollack.
- Physiology 213. Research in Physiology. Time and credits by arrangement.

  Oster, Shipley, Pollack.

# SCHOOL OF MEDICINE\*

#### ANATOMY

## A. Gross Anatomy

FOR GRADUATES AND ADVANCED UNDERGRADUATES

Anat. 101. Human Gross Anatomy (8). Total number of hours approximately 350. Four conferences and lectures, 18 laboratory hours per week, throughout the first semester. This course consists in a dissection of the human cadaver.

Uhlenhuth, Krahl, Smith and Mech.

<sup>\*</sup>Courses listed under "For Graduates and Advanced Undergraduates" and numbered with 100 are credited for graduate work only when taken to satisfy credits in the minors.

- Anat. 102. Osteology of the Human Skull (1). One period of one hour once a week, for 10 weeks; Wednesdays from 1 to 2 p. m., from September to December, inclusive. Lectures accompanied by demonstrations of the human skull bones.
- Anat. 103. The Peripheral Nervous System (1). One period of two hours once a week, for 10 weeks; Saturdays from 9 to 11 a. m., during the first semester. A lecture course on the essentials of the peripheral nervous system.

- Anat. 201. General Anatomy of the Human Body (8). Same course as 101, but on a more advanced level. It can be taken by graduates as well as postgraduate students and may be taken also during the second semester.

  Uhlenhuth, Krahl.
- Anat. 202. Osteology of the Human Skull (1). Same course as 102, but on a more advanced level. Uhlenhuth.
- Anat. 203. The Peripheral Nervous System (1). Same course as 103, but on a more advanced level. Uhlenhuth.
- Anat. 204. The Anatomy of the Human Pelvis (2). Total number of hours, 60; 15 periods of four hours each, every Tuesday morning from 9 a.m. to 1 p.m., for 15 weeks during the first semester. This course consists in the dissection of both the male and female human pelvis and is open to both graduate students and the postgraduate students specializing in Gynecology, Obstetrics and Urology.

  Uhlenhuth.
- Anat. 205. Fetal and Infant Anatomy (2). Total number of hours, 45; 15 periods of three hours each, every Thursday from 9 a. m. to 12 noon for 15 weeks during the second semester. This course consists chiefly in the dissection of human infants and fetuses, accompanied by discussions and demonstrations.
- Anat. 206. Finer Structure of Muscle (1). Total number of hours, 30. Fifteen periods of two hours each, once a week each Tuesday from 10 a.m. to 12 noon, during the second semester. The course consists of discussions and microscopical demonstrations on the microscopical and submicroscopical structure of muscle.
- Anat. 207. Research in Anatomy. Time and credits by arrangement. Research work may be taken in any one of the branches which form the subject of macroscopical and microscopical anatomy and with any of the instructors listed below.

Uhlenhuth, Figge, Krahl, Smith and Harne.

# B. Histology, Embryology and Neuro-Anatomy For Graduates and Advanced Undergraduates

Hist. 101. Mammalian Histology (6). Total number of hours, 144. Four lectures and eight laboratory hours, four times a week for 12 weeks

during the first semester. This course will involve the systematic study of stained histological preparations. An attempt will be made to give the student a concept of the dynamic aspects of living cells, by means of motion pictures and special demonstrations. Figge and Staff.

Hist. 102. Human Neuro-Anatomy (4). Total number of hours, 96. Two lectures and four laboratory hours per week for 16 weeks of the second semester of every medical school year. Prerequisite. Hist. 101, or equivalent. An integrated general concept of the nervous system will be created in the early part of the course. This will be followed by systematic study of individual parts and tracts from the functional point of view.

Figge and Staff.

# FOR GRADUATES

- Hist. 201. Mammalian Histology. Number of credits by arrangement. Same course as Hist. 101, but with additional work or a more advanced nature. Figge and Staff.
- Hist. 202. Human Neuro-Anatomy. Number of credits by arrangements. Some course as Hist. 102, but with additional work of a more advanced nature. Prerequisite, Hist. 101 and 201. Figge and Staff.
- Hist. 203. Normal and Atypical Growth, Lectures in Problems of Growth. This will include a survey of the literature on experimental cancer research. One hour per week, Wednesday, 2 to 3 p. m., for 10 weeks, second semester.

## BACTERIOLOGY

# FOR GRADUATES AND ADVANCED UNDERGRADUATES

- Bact. 101. General Bacteriology (5). Sixteen hours and 104 laboratory hours. Hachtel and Staff.
- Bact. 102. Immunology (4). Sixteen lecture hours and 56 laboratory hours.

  Hachtel and Staff.

### FOR GRADUATES

- Bact. 201. General Bacteriology (5). Same course as Bact. 101, but with additional work at a more advanced level. Hachtel and Steers.
- Bact. 202. Immunology (4). Same course as Bact. 102, but with additional work at a more advanced level. Hachtel and Steers.
- Bact. 203. Special Problems. Time and credit by arrangement

  Hachtel and Steers.
- Bact. 204. Research. Time and credit by arrangement.

Hachtel and Steers.

## **BIOCHEMISTRY**

### FOR GRADUATES AND ADVANCED UNDERGRADUATES

Biochem. 101. Principles of Biochemistry (8). Seven lectures and conferences and two three-hour laboratory periods a week for 16 weeks. Prerequisites, inorganic, organic, and quantitative or physical chemistry.

Schmidt and Staff.

- Biochem. 201. Principles of Biochemistry (8). Same course as Biochem. 101, but on a more advanced level. Schmidt and Staff.
- Biochem. 202. Special Topics in Biochemistry. Credit proportioned to extent and quality of work accomplished. Prerequisite, Biochem. 101 or 201.
- Biochem. 202. Research. Credit proportioned to extent and quality of work accomplished. Schmidt and Herbst.
- Biochem. 204, 205. Seminar (1, 1). First and second semesters. Schmidt.
- Biochem. 206, 207. Cellular Metabolism (1, 1). First and second semesters. Herbst.

FOR GRADUATES AT ARMY CHEMICAL CENTER, EDGEWOOD, MARYLAND

Biochem. 221, 223. Principles of Biochemistry (2, 2). Two lectures a week, first and second semesters. Prerequisites, undergraduate courses in inorganic, organic, and quantitative or physical chemistry.

Summerson.

Biochem. 222, 224. Experimental Biochemistry (2, 2). One lecture and one three-hour laboratory period a week, first and second semesters. Prerequisite, Biochemistry 221 and 223, which may be taken concurrently, or equivalent preliminary training in Biochemistry.

Summerson and Staff.

- Biochem. 225. Chemistry of Amino Acids and Proteins (2). Two lectures a week, first semester. Prerequisite, Biochemistry 221 and 223, or adequate undergraduate training in organic chemistry, with the consent of the instructor.
- Riochem. 226. Chemistry of Chemotherapeutic Compounds (1). One lecture a week, first semester. Prerequisite, adequate knowledge of organic chemistry. Wagner-Jauregg.
- Biochem. 227. Enzyme Chemistry (2). Two lectures a week, second semester. Prerequisites, Biochemistry 225 (Protein Chemistry), or equivalent training in biochemistry, with consent of instructor. Jandorf.
- Biochem. 228. Seminar. Credit according to work done.

Summerson and Staff.

Biochem. 229. Research. Credit according to extent and quality of work accomplished.

Summerson and Staff.

# PHARMACOLOGY

All students majoring in pharmacology with a view to obtaining the degree of Master of Science or Doctor of Philosophy should secure special training in anatomy, mammalian physiology, organic chemistry, and physical chemistry.

### FOR GRADUATES AND ADVANCED UNDERGRADUATES

Pharm. 101, f.s. General Pharmacology (8). Three lectures and one laboratory. This course consists of 90 lectures and 30 laboratory periods of three hours each, offered each year.

Krantz, Carr, Iwamoto, Bird, Musser, Harne.

### FOR GRADUATES

- Pharm. 202, f,s. General Pharmacology. Same as 101, for students majoring in pharmacology. Additional instruction and collateral reading are required. Krantz, Carr, Iwamoto, Bird, Musser, Harne.
- Pharm. 203. Chemotherapy. Credit in accordance with the amount of work accomplished. Krantz.
- Pharm. 204. Carbohydrate Metabolism. Credit in accordance with the amount of work accomplished. Krantz, Carr.
- Pharm. 205. Research. Credit in accordance with the amount of work accomplished. Krantz, Carr.
- Pharm. 206. Special Problems in Toxicology. Credit in accordance with the amount of work accomplished.
- Pharm. 207. Anesthesia. Credit in accordance with the work accomplished. Krantz, Carr.

FOR GRADUATES AT ARMY CHEMICAL CENTER, EDGEWOOD, MARYLAND

Pharm. 220, 221. Principles of Pharmacology (4, 4). Three lectures and one four-hour laboratory period a week, first and second semesters.

Marrazzi and Staff.

- Pharm. 225. Biometric Principles and Their Application (1). One lecture a week, first semester.

  Horton.
- Pharm. 226. Electropharmacology. Hours and credit to be arranged.

  Marrazzi and Staff.
  - Pharm. 228. Seminar.. Credit in accordance with work done.

    Marrazzi and Staff.
- Pharm. 229. Research. Hours and credit by arrangement.

Marrazzi and Staff.

### PHYSIOLOGY

#### FOR GRADUATES AND ADVANCED UNDERGRADUATES

Physiol. 101. Neurophysiology (2). Two lectures a week, for 15 weeks; second semester. This course covers the physiology of muscle, peripheral nerve, central nervous system and sense organs.

Amberson and Staff.

Physiol. 102. The Principles of Physiology (7). Four lectures, one conference a week, for 15 weeks; 25 four-hour laboratory periods; first semester. This course covers the physiology of circulation, respiration, digestion, the endocrines (including reproduction) and the kidney.

Amberson and Staff.

## FOR GRADUATES

- Physiol. 201. Experimental Mammalian Physiology. Time and credit by arrangement.

  Amberson and Smith.
- Physiol. 202. Blood and Tissue Proteins (2). One lecture a week, for 30 weeks.
- Physiol. 203. Physiology of Reproduction (2). Two hours a week, lectures, conferences and seminars, for 20 weeks.

  Smith.
- Physiol. 204. Electrophysiology (1). One lecture a week, for 15 weeks.
  Oster.
- Physiol. 205. Seminar. Credit according to work done.

Amberson and Staff.

Physiol. 206. Research. By arrangement with the head of the department. Staff.

FOR GRADUATES AT ARMY CHEMICAL CENTER, EDGEWOOD, MARYLAND

Physiol. 221, 222. Principles of Physiology (4, 4). Three lectures and one four-hour laboratory period a week for two semesters.

Himwich and Staff.

- Physiol. 225. Advanced Neurophysiology (2). Two lectures a week for one semester. Himwich and Staff.
- Physiol. 228. Seminar. Credit according to work done.

Himwich and Staff.

Physiol. 229. Research. By arrangement.

Staff.

# SCHOOL OF PHARMACY

# BACTERIOLOGY

FOR GRADUATES AND ADVANCED UNDERGRADUATES

Bact. 115. Serology and Immunology (4). Two lectures and two laboratory periods a week, second semester. Prerequisite, Bacteriology 1. Shay.

A study of the principles of immunity, including the preparation and use of biological products employed in the prevention and treatment of infectious diseases.

## FOR GRADUATES

Bact. 200, 201. Chemotherapy (1-2). One lecture a week, second semested. Prerequisite, Bacteriology 1. Offered in alternate years. Shay.

A study of the chemistry, toxicity, pharmacology and therapeutic value of drugs employed in the treatment of parasitic diseases.

Bact. 202, 203. Reagents and Media (1, 1). One lecture a week. Prerequisite, Bacteriology 115. Offered in alternate years. Shay.

A study of the methods of preparation and use of bacteriological reagents and media.

Bact. 210. Special Problems in Bacteriology. Laboratory course. Credit determined by amount and quality of work. Prerequisite, Bacteriology 115.

A laboratory course on selected problems in bacteriology. Credit determined by amount and quality of work performed.

Bact. 211. Public Health (1-2). One lecture. Prerequisite, Bacteriology 115. Shay.

Lectures and discussions on the organization and administration of state and municipal health departments and private health agencies. The courses will also include a study of laboratory methods.

Bact. 211. Research. Credit determined by amount and quality of work.

Prerequisite, Bacteriology 115.

Shay.

## BOTANY AND PHARMACOGNOSY

## FOR GRADUATES AND ADVANCED UNDERGRADUATES

Bot. 101, 102. Taxonomy of the Higher Plants (2, 2). One lecture and one laboratory period a week. Prerequisites, Botany 1, 21. Given in alternate years.

A study of the kinds of seed plants and ferns, their classifications, and field work on local flora. Instruction will be given in the preparation of an herbarium.

Bot. 111, 113. Plant Anatomy (2, 2). Two lectures a week. Prerequisites, Bot. 1, 21, 22.

Lectures covering advanced plant anatomy with special emphasis placed on the structure of roots, stems and leaves of vascular plants.

Bot. 112, 114. Plant Anatomy (2, 2). Two laboratory periods a week. Prerequisites, Bot. 111, 113.

Laboratory work covering Botany 111, 113.

### FOR GRADUATES

Pharmacognosy 201, 202. Advanced Study of Vegetable Powders (4, 4).

Two lectures and two laboratory periods a week. Prerequisites, Bot.

111, 113, 112, 114.

Slama.

A study of powdered vegetable drugs and spices from the structural and microchemical standpoints, including practice in identification and detection of adulterants. Given in alternate years.

Pharmacognosy 211, 212. Advanced Pharmacognosy (4, 4). Two lectures and two laboratory periods a week. Prerequisites, Bot. 111, 113, 112, 114.

A study of many crude drugs not ordinarily studied in other pharmacognosy courses. Special attention will be given to practical problems and to the identification and detection of adulterants.

Pharmacognosy 220. Research. Credit according to amount and quality of work performed, Slama.

### PHARMACEUTICAL CHEMISTRY

# FOR GRADUATES AND ADVANCED UNDERGRADUATES

Pharm. Chem. 111, 113. Chemistry of Medicinal Products (2, 2). Two lectures a week, first and second semesters. Prerequisites, Chem. 35, 37, 53.

A survey of the structural relationships, the synthesis and chemical properties of medicinal products.

Pharm. Chem. 112, 114.—Chemistry of Medicinal Products (2, 2). Two laboratory periods a week, either or both semesters. Prerequisites, Pharm. Chem. 111, 113, or may be taken simultaneously with Pharm. Chem. 111, 113.

Laboratory exercises dealing with important and characteristic chemical properties of pharmaceutical and medicinal products.

Chem. 142, 144. Advanced Organic Laboratory (2, 2). Two laboratory periods a week, any one or both semesters. Prerequisites, Chem. 19 or 23, and Chem. 37, 38.

Laboratory work devoted to more difficult organic preparations and a study of the quantitative determination of carbon, hydrogen, nitrogen and halogen in organic compounds.

Chem. 146, 148. Identification of Organic Compounds (2, 2). One lecture and two laboratory periods a week, any one or both semesters. Prerequisites, Pharm. Chem. 111, 113, or Chem. 141, 143. Miller.

The systematic identification of organic compounds.

Chem. 151, 153. Physiological Chemistry (2, 2). Two lectures a week, first and second semesters. Prerequisites, Chem. 35, 37 and Physiology 22. Chapman.

A general survey of the subject including a discussion of digestion, metabolism, vitamins, hormones and other topics of pharmaceutical interest.

Chem. 152, 154. Physiological Chemistry (2, 2). Two laboratory periods a week, first and second semesters. Prerequisites, Chem. 35, 37, 151, 153, or may be taken simultaneously with Chem. 151, 153. Chapman.

Laboratory exercises mostly quantitative, designed to illustrate the more important procedures in physiological chemistry, urinalysis and blood analysis.

# FOR GRADUATES

- Pharm. Chem. 201, 203. Survey of Pharmaceutical Chemistry (2, 2). Two lectures a week, first and second semesters. Prerequisites, Pharm. Chem. 111, 113.
  - A study of the terpenes, carotenes, sterols and stereoisomerism.
- Pharm. Chem. 211, 213. Chemistry of the Alkaloids (2, 2). Two lectures a week, first and second semesters. Prerequisites, Pharm. Chem. 111, 113.

A study of the chemical structure and reactions of pharmacologically active bases.

Pharm. Chem. 220. Advanced Pharmaceutical Syntheses (2-6). Laboratory and conferences, either or both semesters. Prerequisites, Chem. 142, 144, or Pharm. Chem. 112, 114.

Application of synthetic procedures in the preparation of various medicinal chemicals and their intermediates.

Pharm. Chem. 222. Advanced Pharmaceutical Analyses (1-4). Laboratory and conferences, either or both semesters. Prerequisites, Chem. 146, 148.

A laboratory study of the analytical procedures and methods as applied to official, proprietary, natural and synthetic drugs, their intermediates and derivatives.

Pharm. Chem. 230. Pharmaceutical Chemistry Seminar (1). Required of students majoring in pharmaceutical chemistry each semester. Hager.

Reports of progress and survey of recent developments in pharmaceutical chemistry.

- Pharm. Chem. 235. Research in Pharmaceutical Chemistry. Credit determined by amount and quality of work performed. Hager and Staff.
- Chem. 258. The Identification of Organic Compounds. An advanced course.

  Two to four laboratory periods a week, either semester. Prerequisites,
  Chem. 146, 148, or equivalent.

  Miller.

Laboratory work devoted to the identification of pure organic substances and mixtures.

# PHARMACOLOGY

FOR GRADUATES AND ADVANCED UNDERGRADUATES

Pharmacology 111. Official Methods of Biological Assay (4). Two lectures and two laboratory periods a week, first semester. Prerequisite, Pharmacology 51, 52. Chapman.

A study of the methods of biological assay official in the United States Pharmacopoeia and the National Formulary.

### FOR GRADUATES

Pharmacology 201, 202. Methods in Biological Assay (4, 4). Two lectures and two laboratory periods a week, first and second semesters. Prerequisite, Pharmacology 111. Offered in alternate years. Chapman.

The application of statistical methods to the problems of biological assay and a study of the more important unofficial methods for the assay of therapeutic substances.

Pharmacology 211, 212. Special Studies in Pharmacodynamics (4, 4). Two lectures and two laboratory periods a week, first and second semesters. Prerequisites, Pharmacology 51 and 52 and the approval of the instructor.

Chapman.

The procedures involved in pharmacological analysis and in the determination of the site of action and the nature of action of drugs. Given in alternate years.

Pharmacology 221, 222. Special Studies in Biological Assay Methods (2-4, 2-4). Credit according to amount of work undertaken after consultation with the instructor. Laboratory work and conferences, first and second semesters. Prerequisites, Pharmacology 111, 201, 202. Offered in alternate years.

Special problems in the development of biological assay methods and comparative standards.

Pharmacology 250. Research in Pharmacology. Properly qualified students may arrange semester hours' credit with the instructor. Chapman.

## PHARMACY

FOR GRADUATES AND ADVANCED UNDERGRADUATES

Pharmacy 101, 102. (3, 3). Two lectures and one laboratory a week. Prerequisites, Pharmacy 51, 52 and consent of the instructor.

Allen, Balassone.

A continuation of the course given in the second year, with special reference to the methods employed in the manufacture of pharmaceuticals on a commercial scale.

Pharmacy 111, 112. Advanced Prescription Compounding (3, 3). Two laboratory periods a week. Prerequisites, Pharmacy 51, 52.

Allen, Kahn.

Advanced laboratory study of the various methods of compounding special prescriptions and galenical preparations.

Pharmacy 120. Hospital Management (2). Two lectures a week. Prerequisites, Pharmacy 51, 52. Purdum.

A study of hospital pharmacy practice and administration.

Pharmacy 201, 202. Advanced Pharmaceutical Technology (4, 4). Two lectures and two laboratory periods a week. Prerequisites, Pharmacy 101, 102. Foss, Purdum, Allen.

A study of pharmaceutical manufacturing processes, equipment and physical plant arrangement.

Pharmacy 211, 212. Survey of Pharmaceutical Literature (1, 1). One lecture a week. Prerequisite, Pharmacy 51, 52 and 61. Purdum.

Lectures and topics on the literature pertaining to pharmacy, with special reference to the original and development of the works of drug standards and the pharmaceutical periodicals.

Pharmacy 221, 222. History of Pharmacy (2, 2). Two lectures a week. Given in alternate years. Prerequisite, Pharmacy 61.

Lectures and assignments on the development of pharmacy in America and the principal countries of Europe. Given in alternate years.

Pharmacy 230. Pharmacy Seminar (1). Each semester. Foss, Purdum. Reports of progress in research and surveys of recent developments in pharmacy.

Pharmacy 235. Research in Pharmacy. Credit and hours to be arranged. Foss, Purdum.

## PHYSICS AND PHYSICAL CHEMISTRY

FOR GRADUATES AND ADVANCED UNDERGRADUATES

Chem. 187, 189. Physical Chemistry (3, 3). Three lectures a week, first and second semesters. Prerequisites, Phys. 11; Chem. 15, 35, 37.

Estabrook.

A study of the laws and theories of chemistry, including the gas laws, kinetic theory, liquids, solutions, elementary thermodynamics, thermochemistry, equilibrium, chemical kinetics and electro-chemistry.

Chem. 188, 190. Physical Chemistry (2, 2). Two laboratory periods a week, first and second semesters. Prerequisite, Chem. 187, 189, or may be taken simultaneously with these courses. Estabrook.

Quantitative experiments are performed which demonstrate physiochemical principles, and acquaint the student with precision apparatus.

Phys. 104, 105. Electricity and Magnetism (3, 3). Two lectures and one laboratory period a week, first and second semesters. Given in alternate years. Prerequisites, Phys. 11; Math. 21. Estabrook.

## FOR GRADUATES

Phys. 200, 201. Introduction to Theoretical Physics (5, 5). Five lectures a week, first and second semesters. Given according to demand.

Estabrook.

Phys. 208, 209. Thermodynamics (2, 2). Two lectures a week, first and second semesters. Prerequisites, Phys. Chem. 187, 189, 188, 190. Given in alternate years.



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